Service Training manual

GT-I9105P

Advanced H/W R&D

Group 2

SAMSUNG Electronics Co., Ltd.

Notice :

All functionality, features, specifications and other product information provided in this document including, but not limited to, the benefits, design, pricing, components, performance, availability, and capabilities of the product are subject to change without notice or obligation.

Samsung reserves the right to make changes to this document and the product described herein, at anytime, without obligation on Samsung to provide notification of such change.

Contents

- Concept & Main features
- Block Diagram
- Component & Location
- Disassembly and Assembly
- Trouble shooting
- Calibration
- MHL and OTG

Concept & Main features

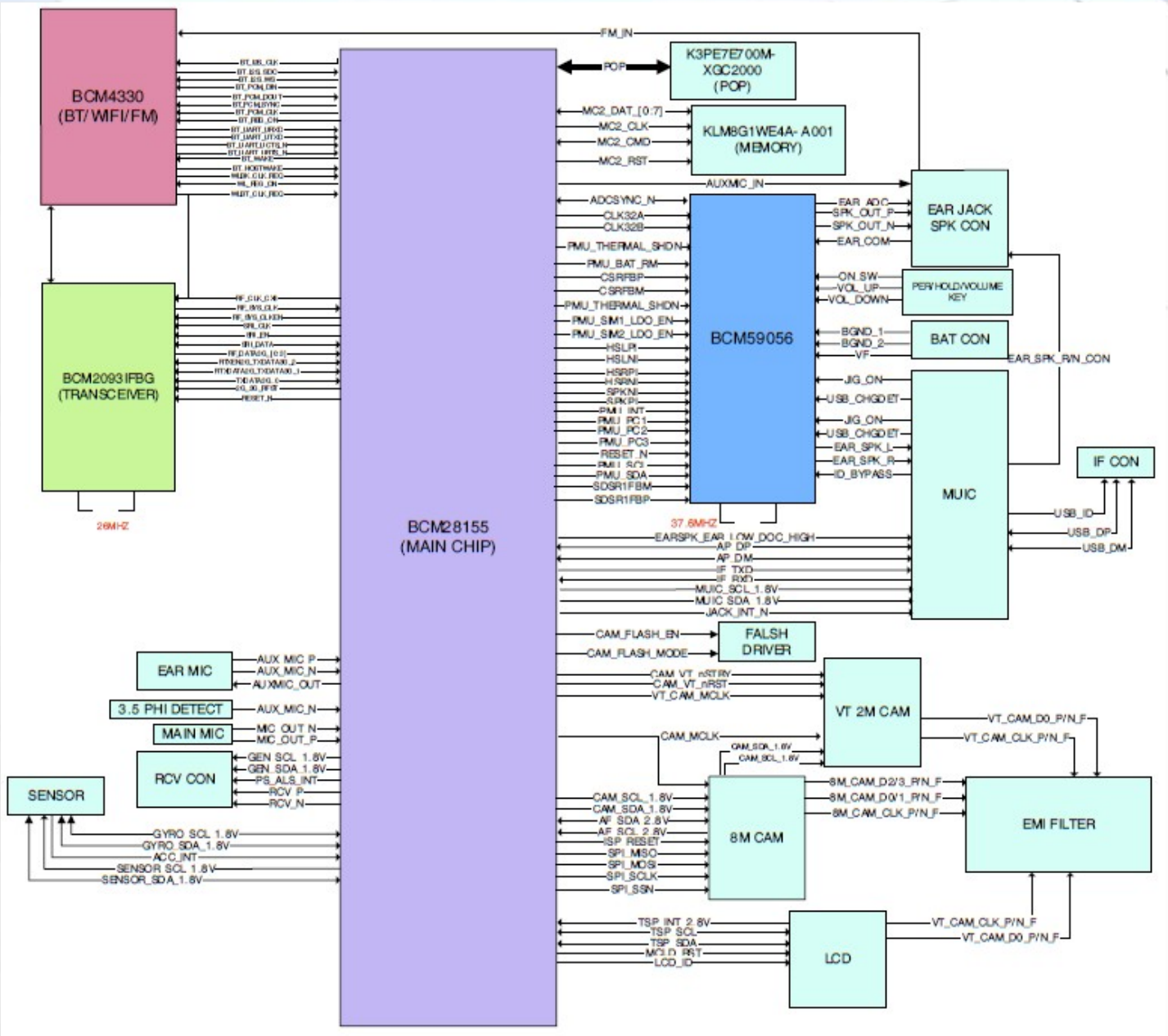
Category	Description
B/B Chipset	Broadcom BCM28155
Standard	HSPA+ **21Mbps**/HSUPA 5.76Mbps EDGE/GPRS Class 12
RF Band	Quad band GSM 850/900/1800/1900MHz Quad band UMTS 850/900/1900/2100
Application Chipset	BCM28155 **(Dual 1.2GHz**)
Dimension	66.1 x 125.3.x **8.89**mm
Display	4.27” WVGA Super AMOLED Plus
Camera	8MP AF w **LED Flash** / 2MP Front
Flash	**LED Flash**
Memory	8Gb RAM, 8GB Internel SD
Ex. Memory	Micro SD (Up to 32GB)
Antenna	Integrated Antenna
SIM	Sliding Type, 3V Only
Sensor	Accelerometer, Digital Compass, Proximity, Light**, Gyro**

Category	Description
Battery	Li-Ion 1650mAh
- STD time	Min 680H(2G)/ 560H(3G)(@PL5) – TBD
- Talk time	Min 1000min(2G)/ 500min(3G) (@PP2) – TBD
Connectivity	Wi-Fi 802.11 a/b/g/n (**2.4GHz/5GHz)** **BT v4.0** **USB 2.0 OTG, MHL**
IF Connector	Micro-USB
Speaker/ Receiver	Speaker : 15x11mm Receiver : 12x07
Ear Jack	**Φ3.5 (4)**
CMF	**Front : Strengthened Glass** **Rear :** Battery Cover PC **Main Color :** Black
VPS	**Package :** QSG, Mini TA, Earphone **Option :** Vehicle Dock, Desk Dock, Leather Case USB Gender(USB OTG), Power Pack, MHL
User Benefit	- Best Media Experience via 4.27” sAMOLED Plus - Precise Motion UI & Multi touch - Seamless Sharing Experience

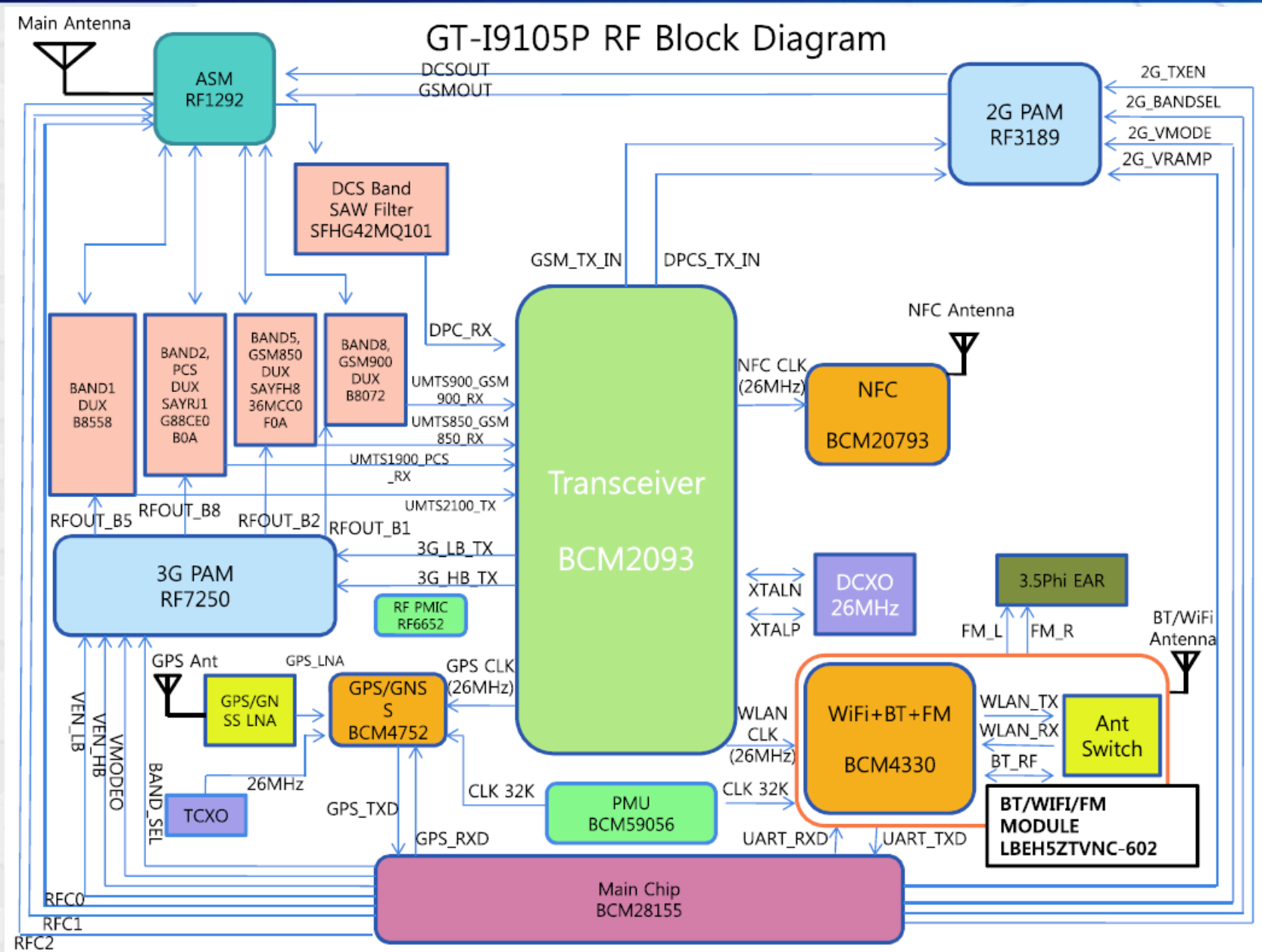
Contents

- Concept & Main features
- **Block Diagram**
- Component & Location
- Disassembly and Assembly
- Trouble shooting
- Calibration

Block Diagram (Baseband)



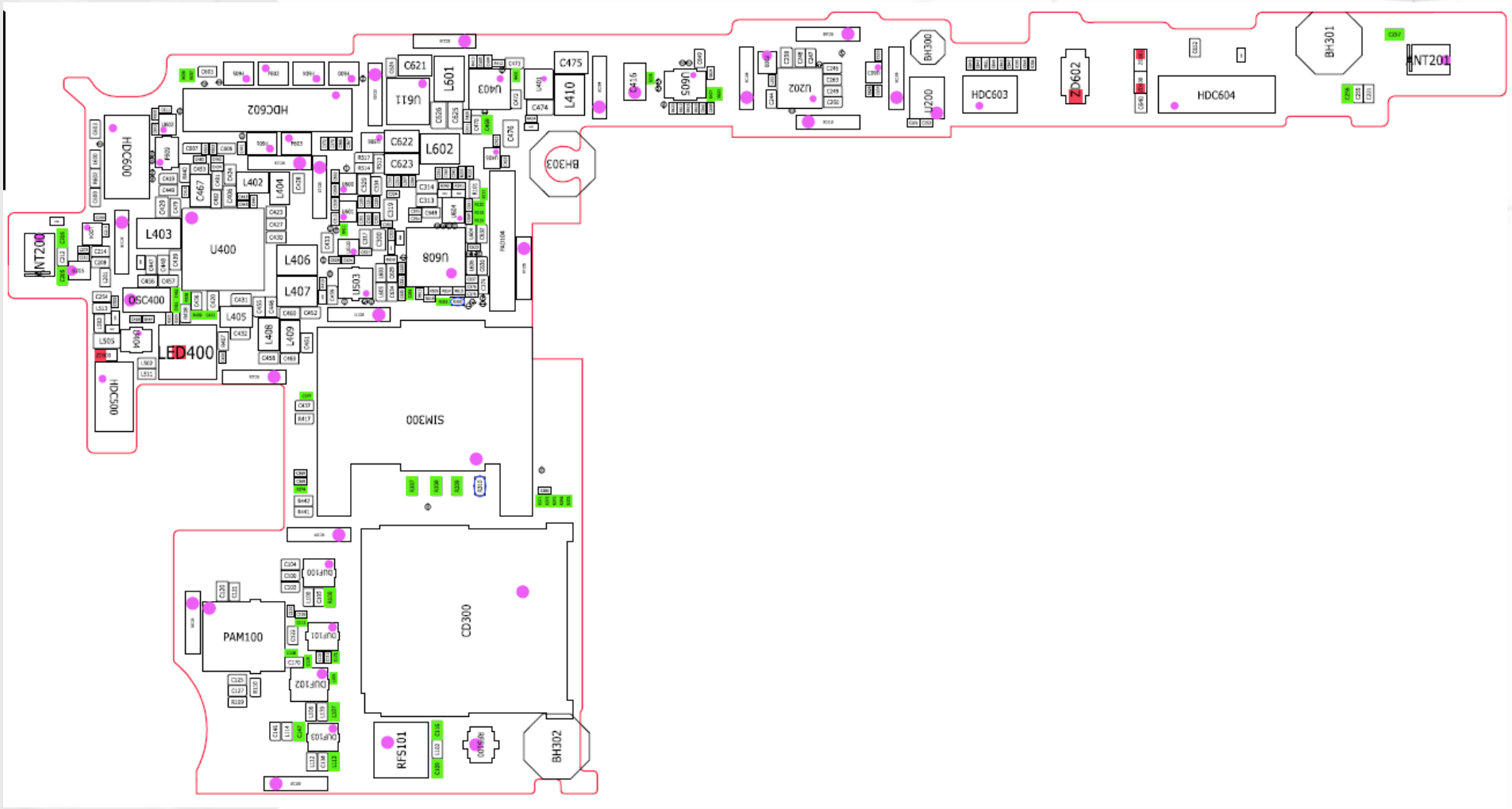
Block Diagram (RF)



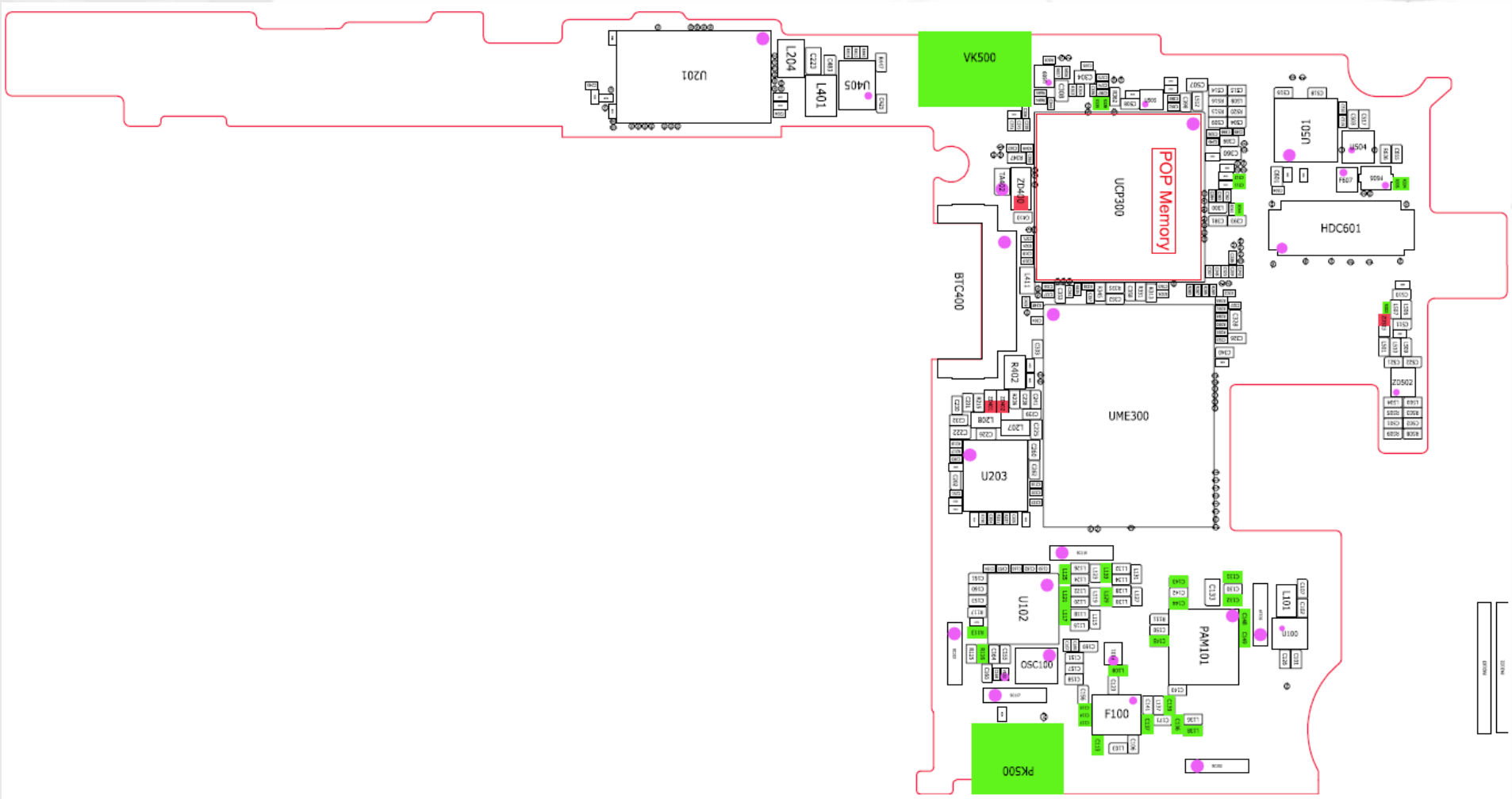
Contents

- Concept & Main features
- Block Diagram
- **Component & Location**
- Disassembly and Assembly
- Trouble shooter
- Calibration

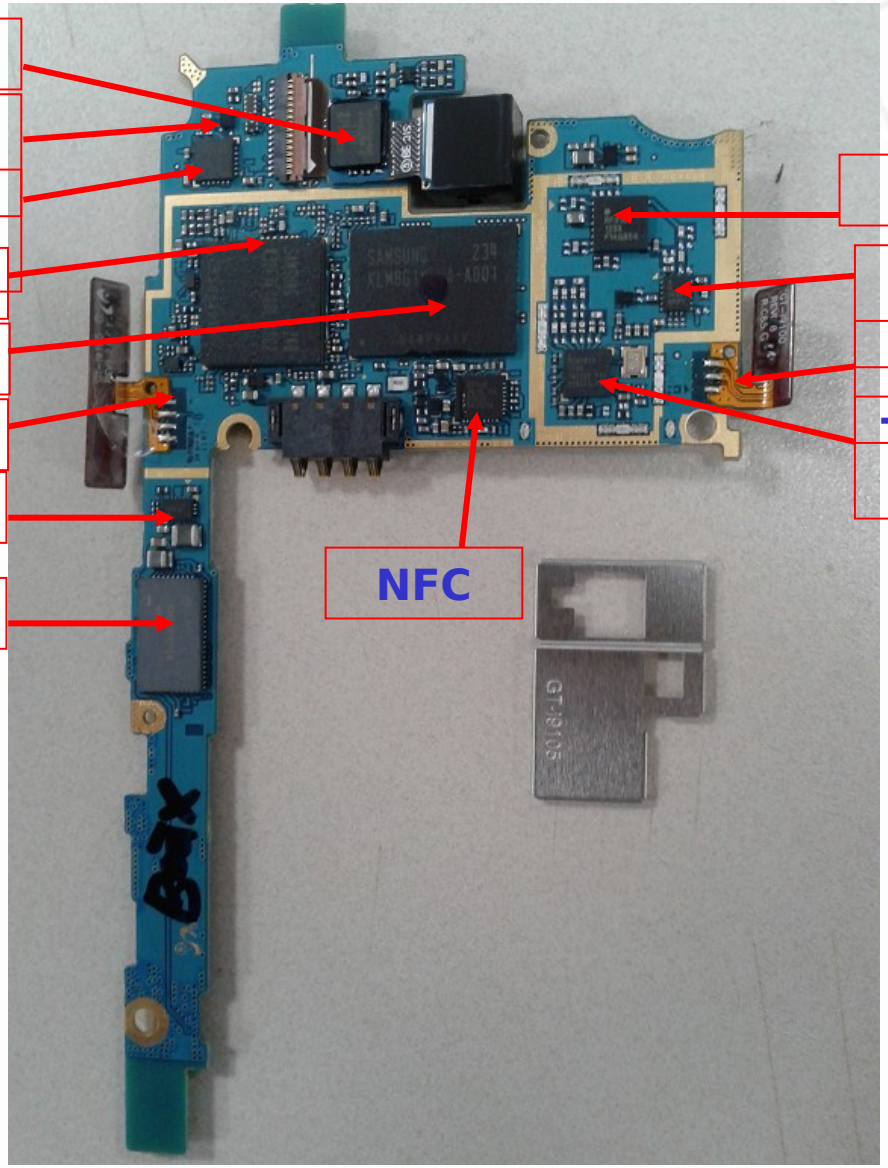
PCB Diagram (TOP)



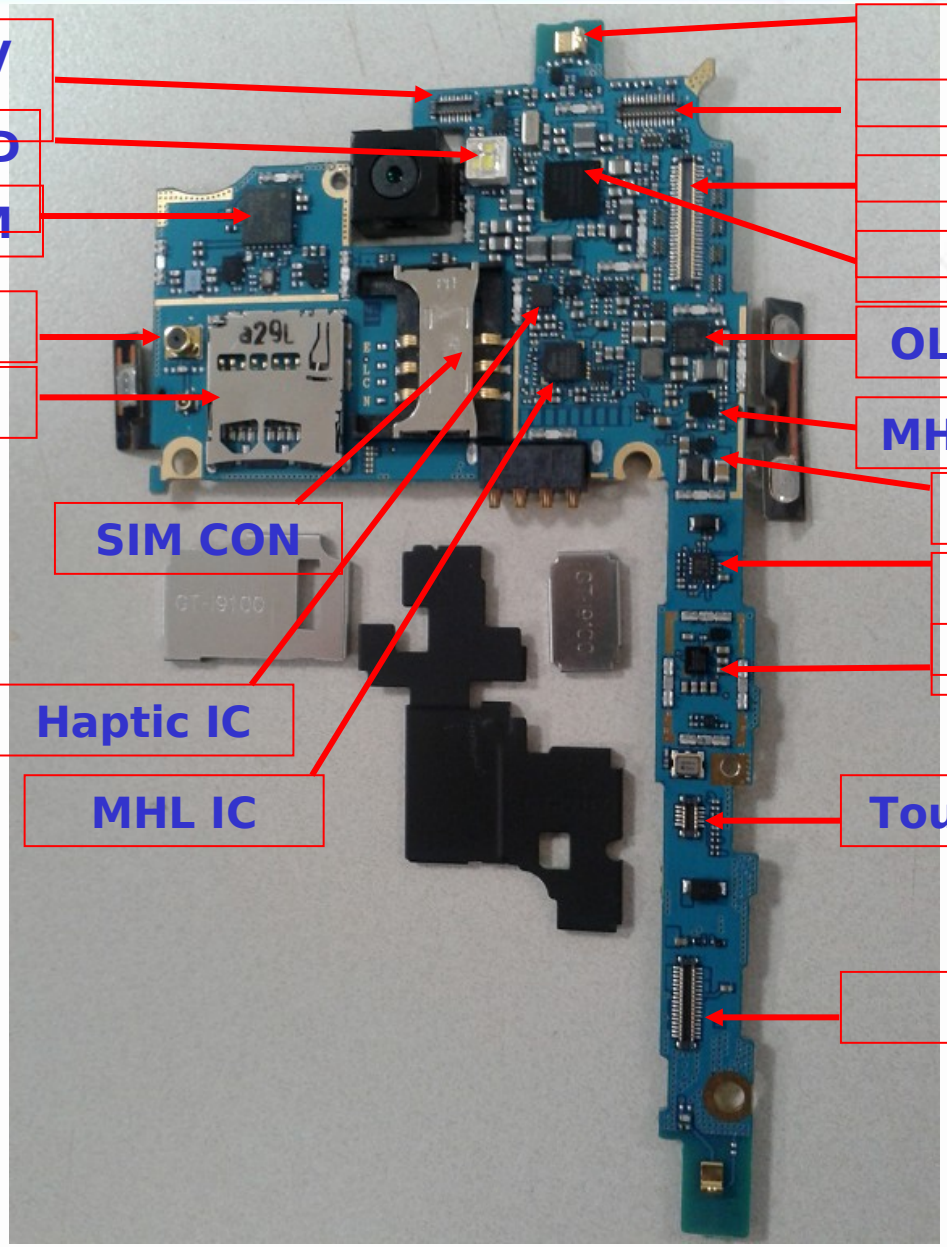
PCB Diagram (BOTTOM)



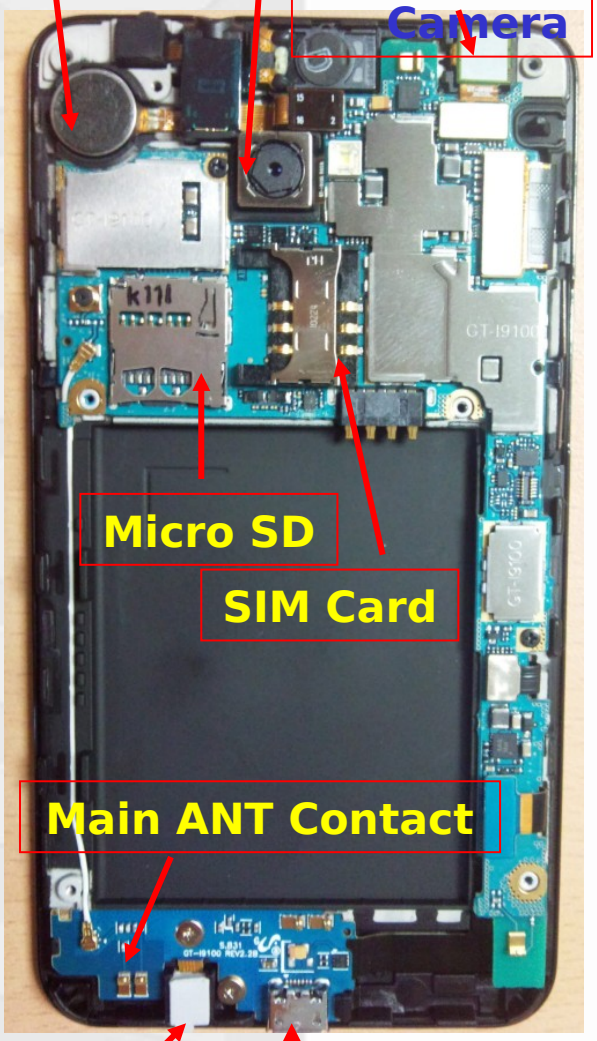
Main Top

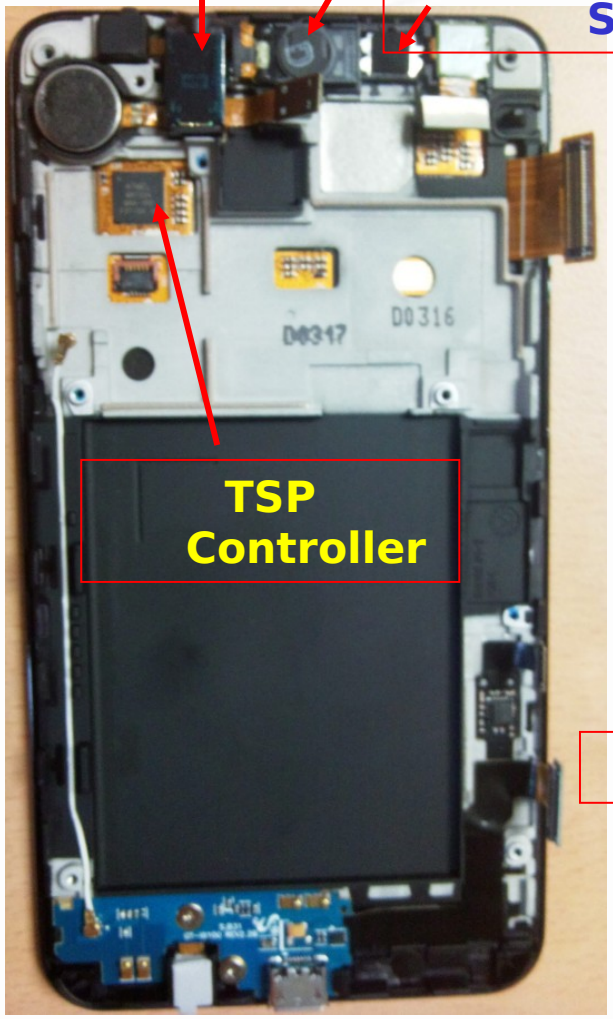

8M Camera
Magnetic Sensor
Gyro/Acc. Sensor
AP/CP
Movi-MCP
Volume Keys
CAM Flash IC
BT/WIFI/FM
NFC
2G PAM
SAW Filter
Power Keys
Tranceiver

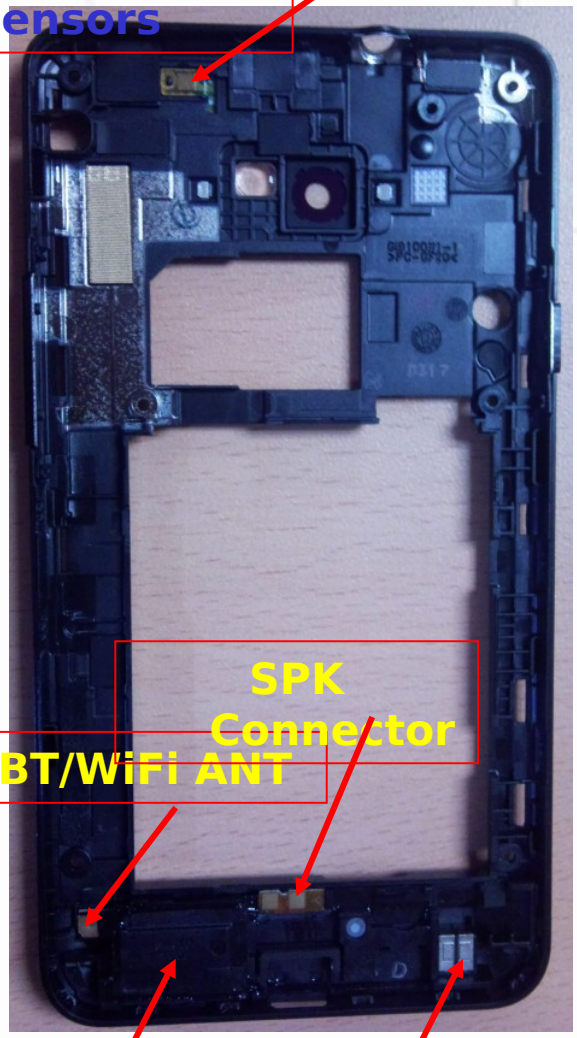
Main Bottom


Earjack/Motor/RCV CON
Flash LED
3G PAM
RF Switch
Micro SD
SIM CON
Haptic IC
MHL IC
GPS ANT Contact
VT CAM Connector
OLED TSP Connector
PMIC
OLED Driver IC
MHL/USB SW IC
OTG
M-USB SW IC
GPS
Touch Key Connector
USB/SPK CON

Ass'y


Motor
8M Camera
2M Camera
Micro SD
SIM Card
Main ANT Contact
Mic
Micro USB Connector


3.5pi Earjack
Receiver
Light/Proximity Sensors
TSP Controller


GPS ANT
SPK Connector
BT/WiFi ANT
Speaker
Main ANT

Contents

- Concept & Main features
- Block Diagram
- Component & Location
- **Disassembly and Assembly**
- Trouble shooting
- Calibration

Disassembly

1

Release the screws at 7 points.
(Torque: 1.1±0.1 kgf.cm)
(Size: M1.4*L3)

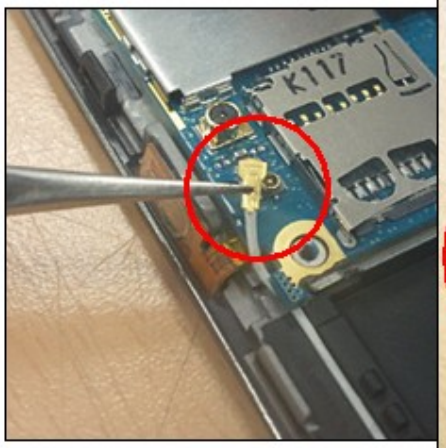
DO NOT MAKE SCRATCH ON THE REAR.

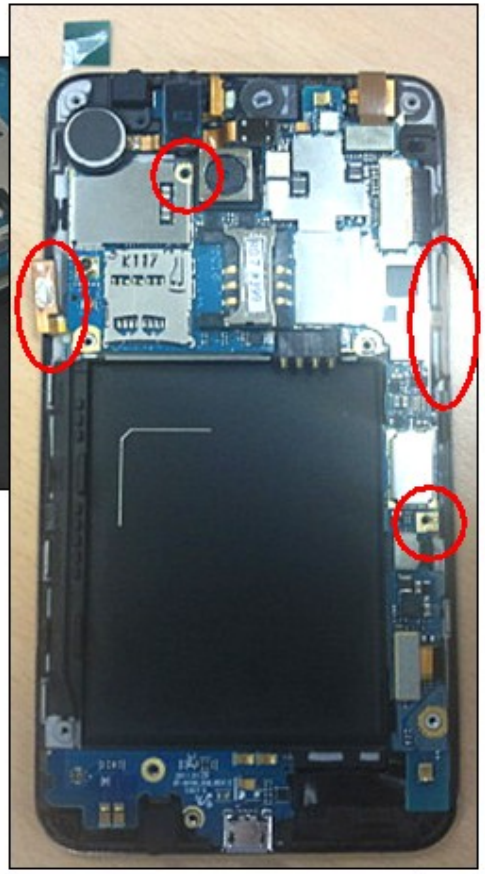
2

Disjoint hook 12 points at the rear

Disassembly

3

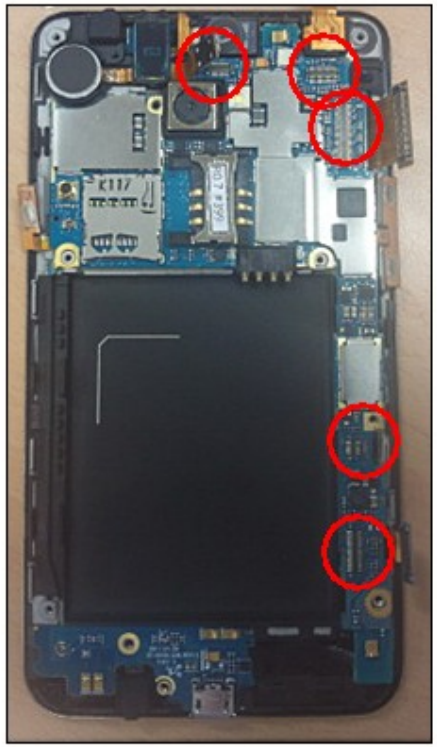




Separate the cable from the PBA.
Release the screw 2point(Size: M1.4*L3)
(Torque: 1.1±0.1 kgf.cm)
Detach the side FPCBs from the Bracket.

Be careful not to rip up the FPCBs.

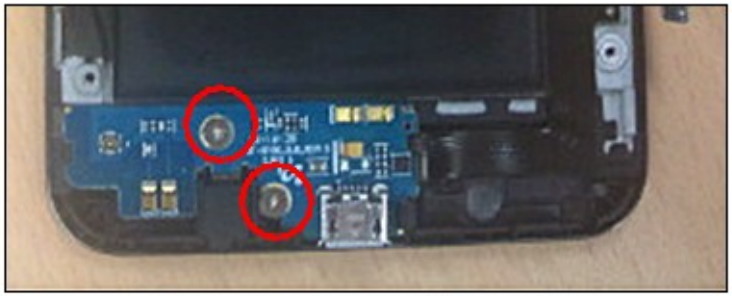
4

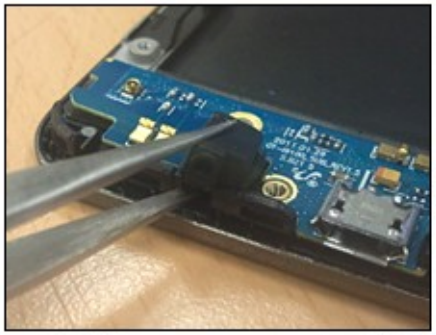


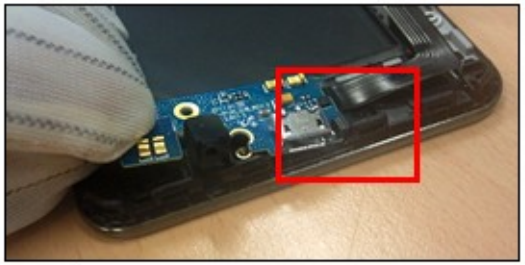
Separate all connectors from the PBA.
Separete the PBA fromt the Front.

Disassembly

5

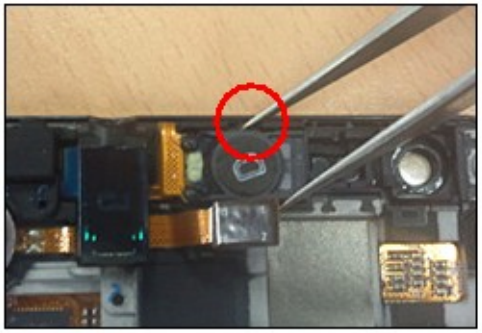


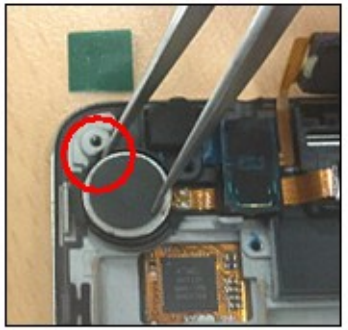


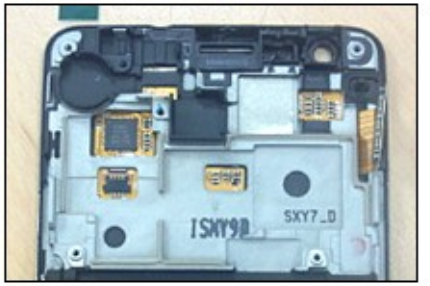


Release the screw 2point(Size: M1.4*L2)
(Torque: 1.1±0.1 kgf.cm)
Separate the sub PBA from the PBA.

6





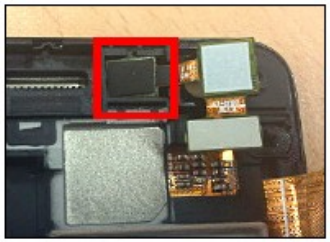


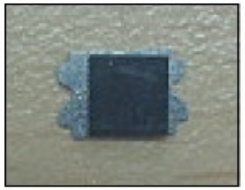
Separate the Receiver Ass'y from the Front.
(Insert a tool into the holes.)

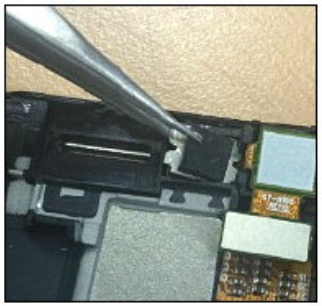
Be careful not to rip up the FPCBs.

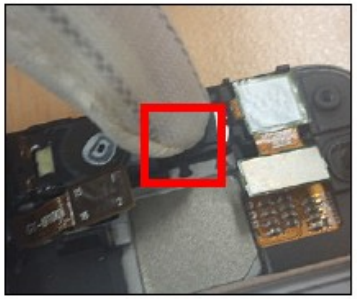
Assembly

1





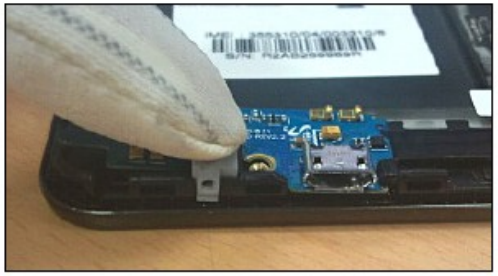


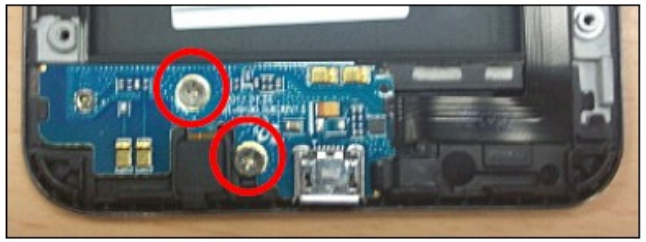


Insert the VGA Ass'y in the Front.
Put the chassis on the sensor.

Be careful not to tear up the TSP FPCB.

2

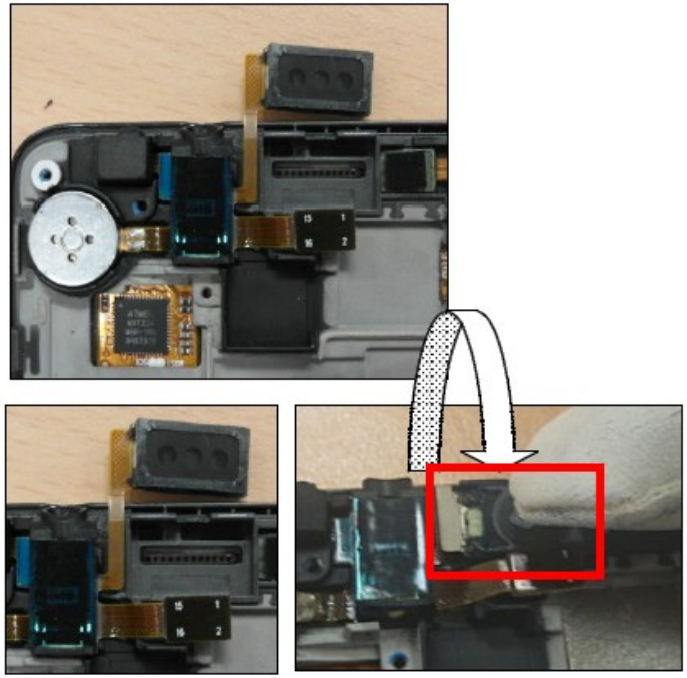




Attach the FPCB on the Front.
Insert the sub PBA in the hook.
Attach the FPCB on the Front.
Screw 2 points.(Size: M1.4*L2)
(Torque: 1.1±0.1 kgf.cm)

Assembly

3



Put the Receiver Ass'y on the Front.
Furl the Receiver and put it on the Front.

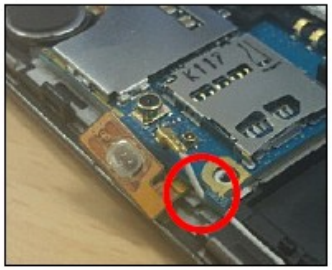
Be careful to damage the LCD FPCB.

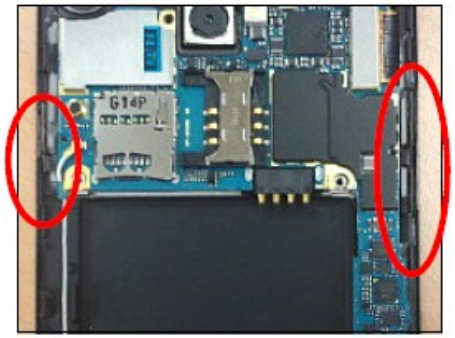
4

Connect the cable on the sub PBA.
Organize the cable in the furrow.

Assembly

5

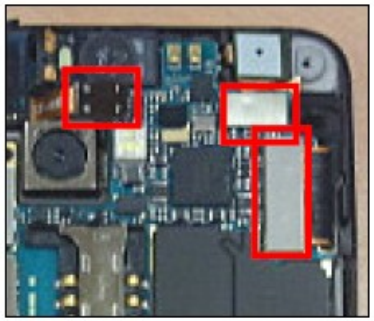


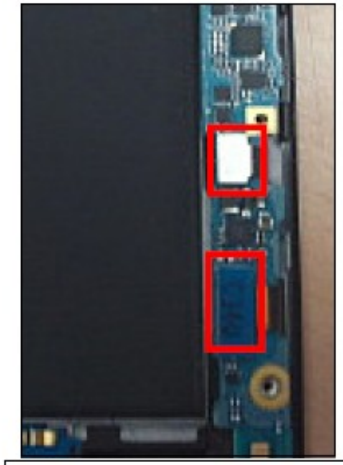


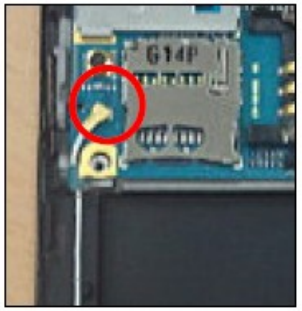
Put the PBA on the Front.
Attach the side FPCBs on the Bracket.

Be careful to damage the cable.

6







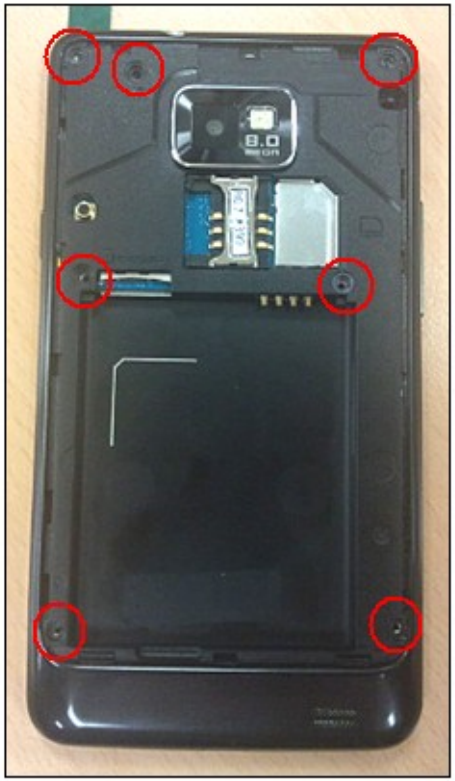
Connect all the connector on the PBA.
Connect the cable on the PBA.

Assembly

7

Asseble the Rear and the Front.
Hook at the 12 points.

8



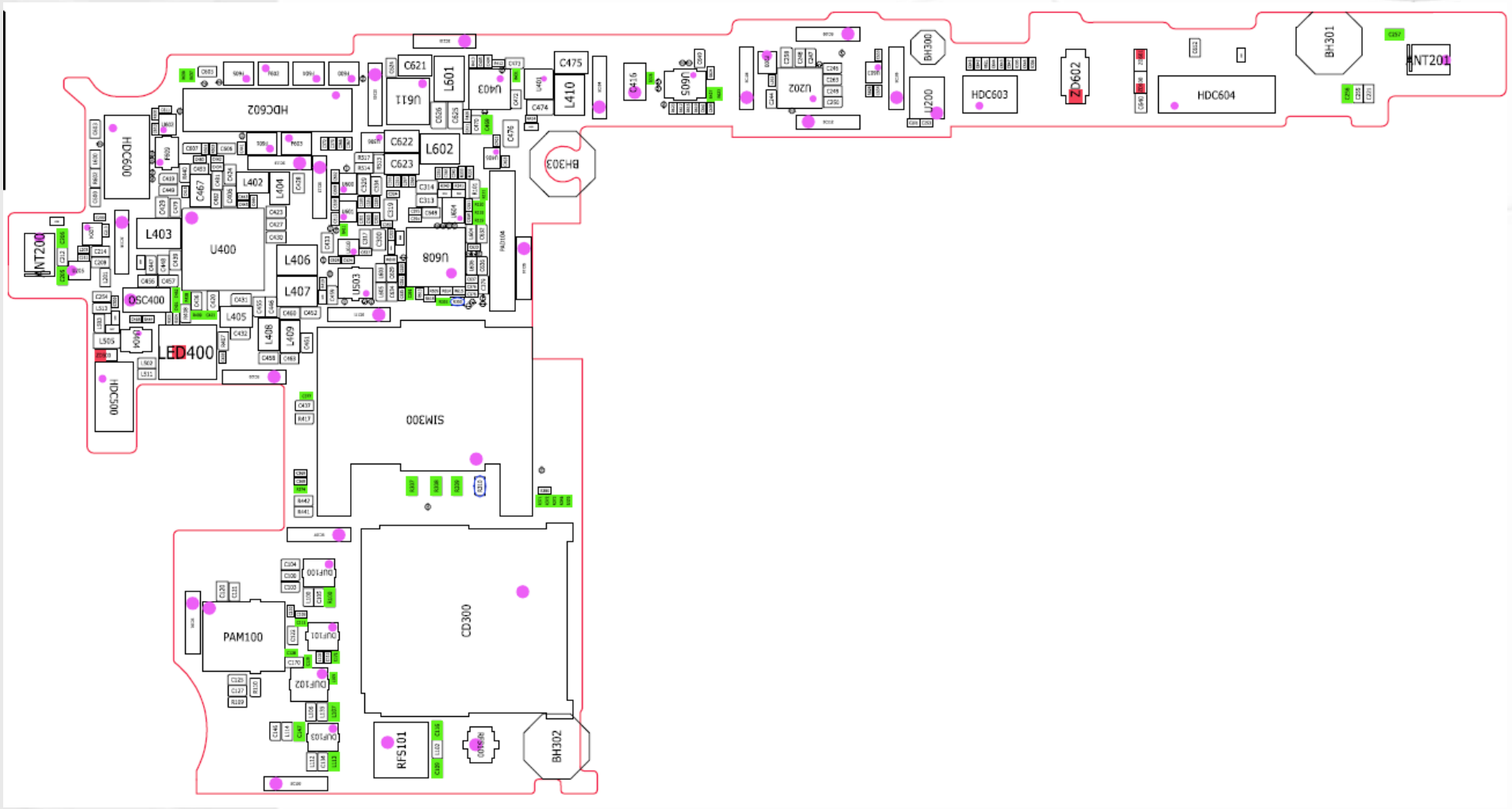
Screws at 7 points.
(Torque: 1.1±0.1 kgf.cm)
(Size: M1.4*L3)

DO NOT MAKE SCRATCH ON THE REAR.

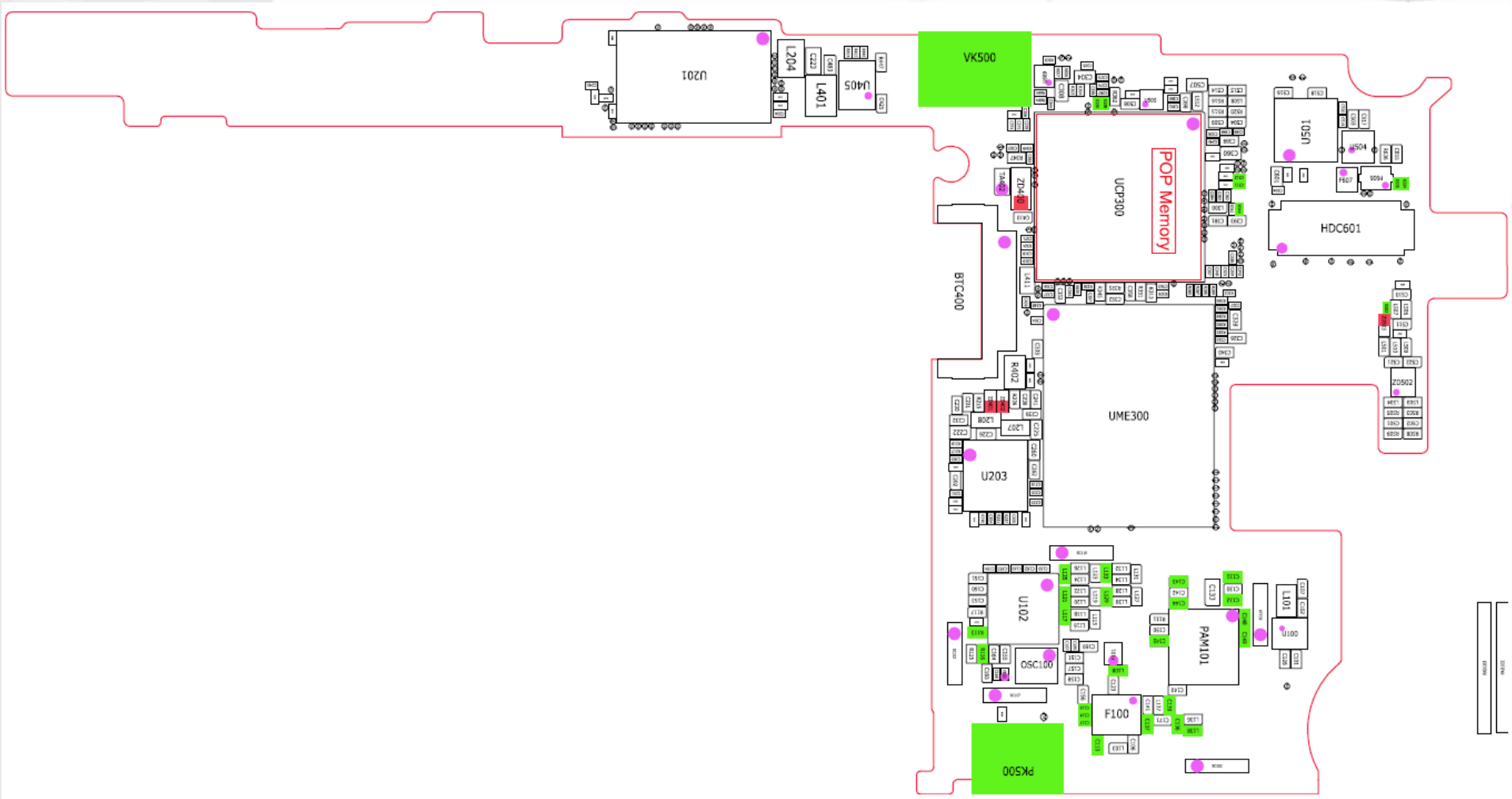
Contents

- Concept & Main features
- Block Diagram
- Component & Location
- Disassembly and Assembly
- **Trouble shooting**
- Calibration

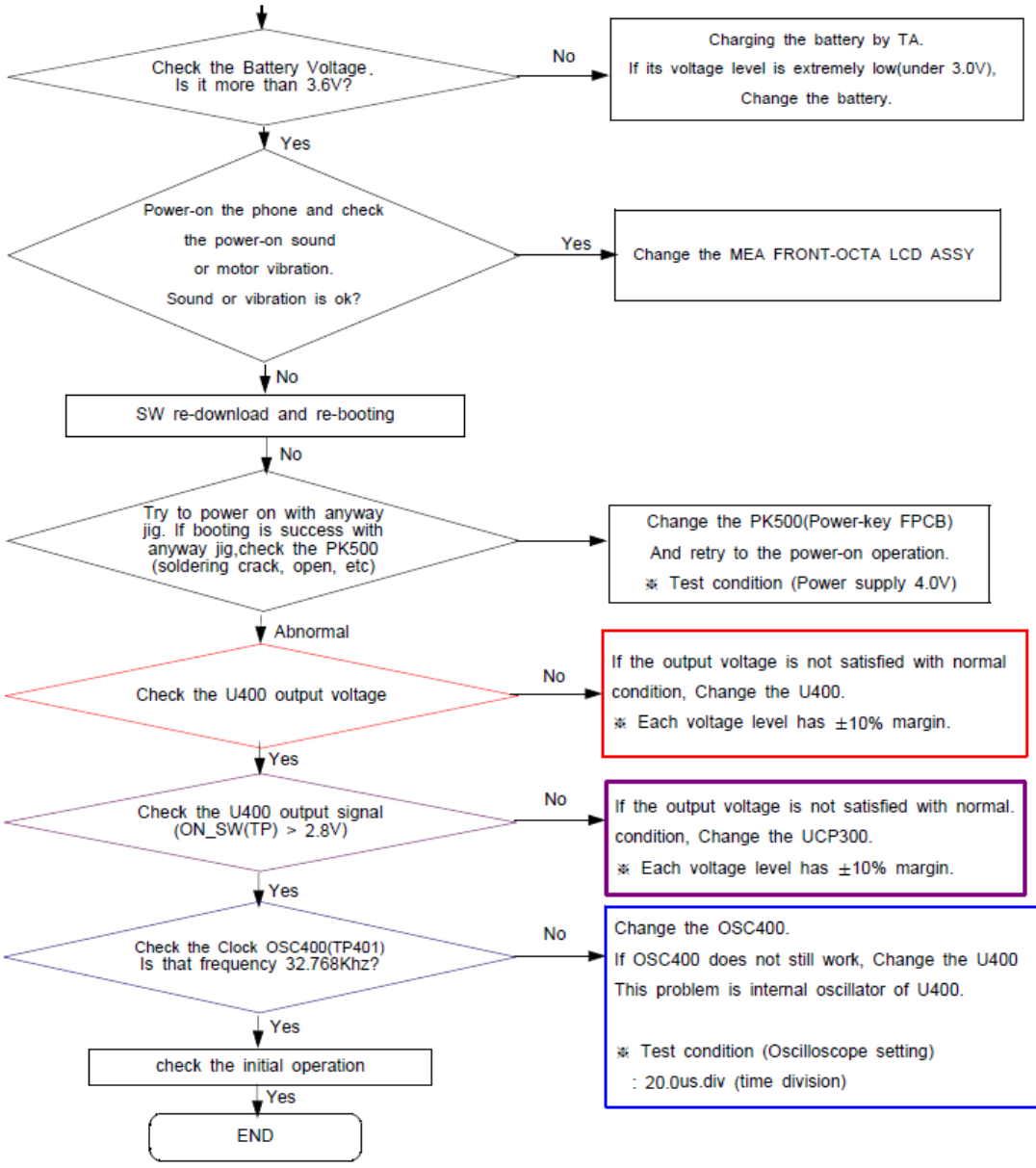
PBA Diagram (TOP)

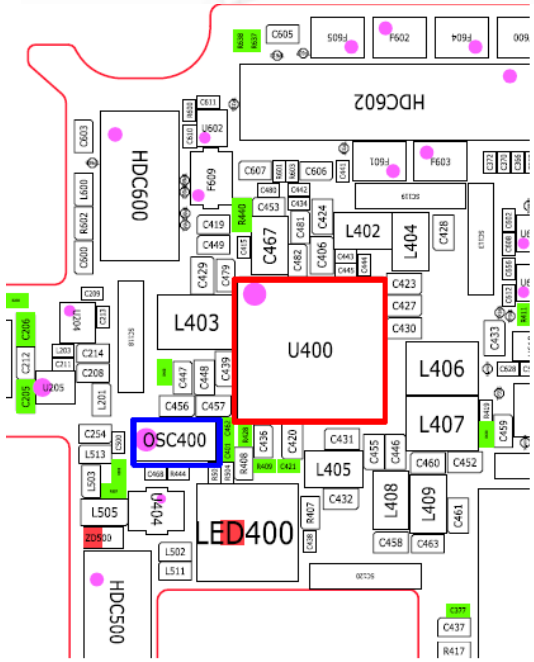


PBA Diagram (BOTTOM)

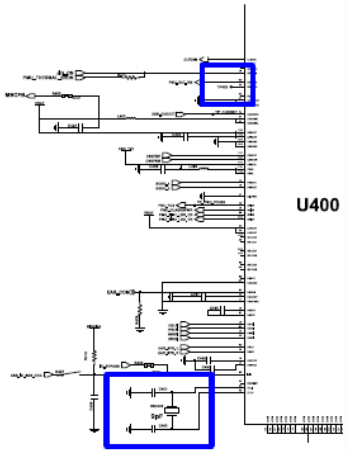


Power ON

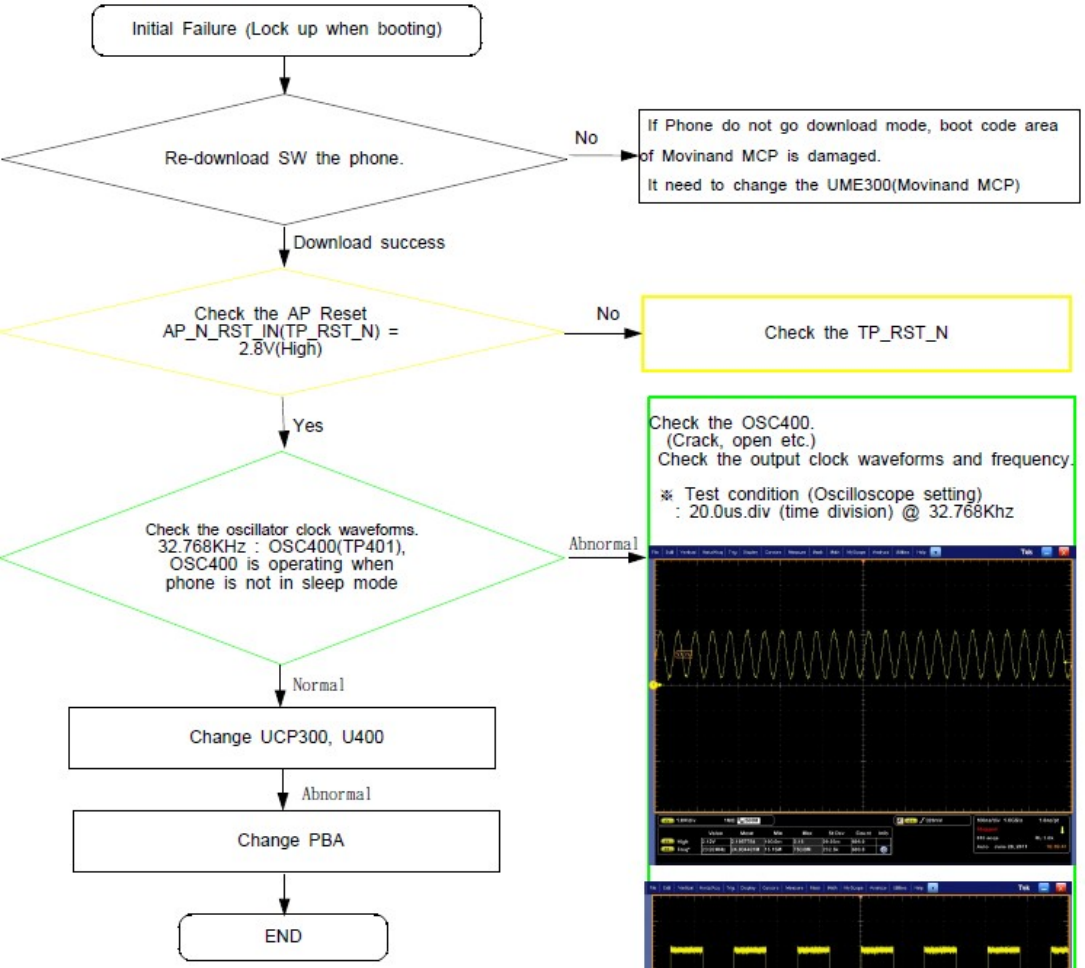

Check the Battery Voltage.
Is it more than 3.6V?
No
Charging the battery by TA.
If its voltage level is extremely low(under 3.0V),
Change the battery.
Yes
Power-on the phone and check
the power-on sound
or motor vibration.
Sound or vibration is ok?
Yes
Change the MEA FRONT-OCTA LCD ASSY
No
SW re-download and re-booting
No
Try to power on with anyway
jig. If booting is success with
anyway jig,check the PK500
(soldering crack, open, etc)
Change the PK500(Power-key FPCB)
And retry to the power-on operation.
※ Test condition (Power supply 4.0V)
Abnormal
Check the U400 output voltage
No
If the output voltage is not satisfied with normal
condition, Change the U400.
※ Each voltage level has ±10% margin.
Yes
Check the U400 output signal
(ON_SW(TP) > 2.8V)
No
If the output voltage is not satisfied with normal.
condition, Change the UCP300.
※ Each voltage level has ±10% margin.
Yes
Check the Clock OSC400(TP401)
Is that frequency 32.768Khz?
No
Change the OSC400.
If OSC400 does not still work, Change the U400
This problem is internal oscillator of U400.
※ Test condition (Oscilloscope setting)
: 20.0us.div (time division)
Yes
check the initial operation
Yes
END

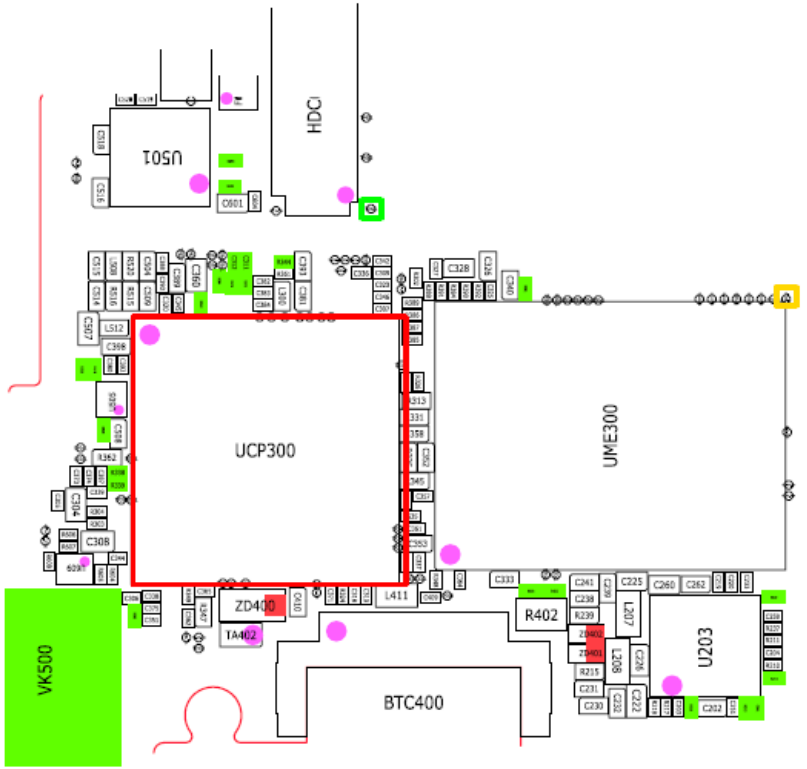

HDC602
HDC600
L402
L404
C467
L403
U400
L406
L407
OSC400
L405
L408
L409
LED400
HDC500

HDC601
USO1
UCP300
UME300
BTC400
U203

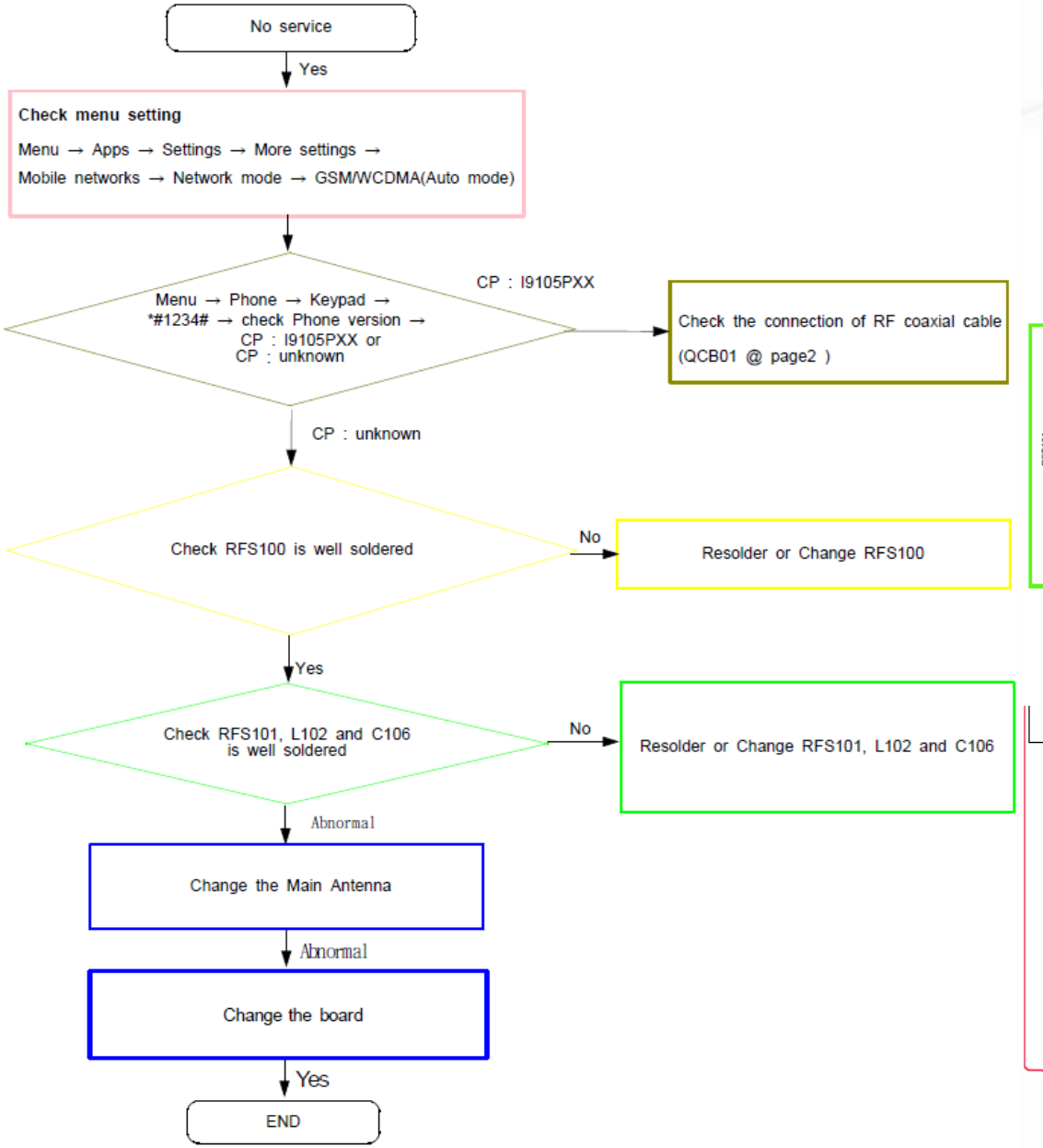

U400

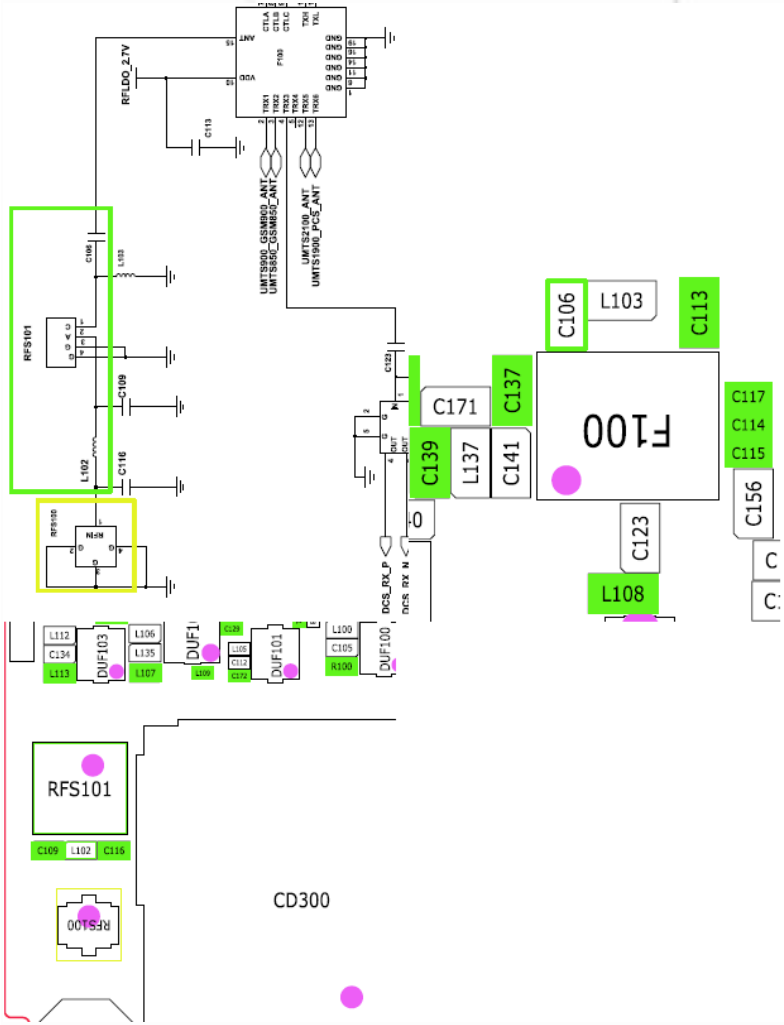
Initial (Lock up)


Initial Failure (Lock up when booting)
Re-download SW the phone.
No
If Phone do not go download mode, boot code area of Movinand MCP is damaged.
It need to change the UME300(Movinand MCP)
Download success
Check the AP Reset AP_N_RST_IN(TP_RST_N) = 2.8V(High)
No
Check the TP_RST_N
Yes
Check the oscillator clock waveforms. 32.768KHz : OSC400(TP401), OSC400 is operating when phone is not in sleep mode
Abnormal
Check the OSC400. (Crack, open etc.) Check the output clock waveforms and frequency.
※ Test condition (Oscilloscope setting) : 20.0us.div (time division) @ 32.768Khz
Normal
Change UCP300, U400
Abnormal
Change PBA
END

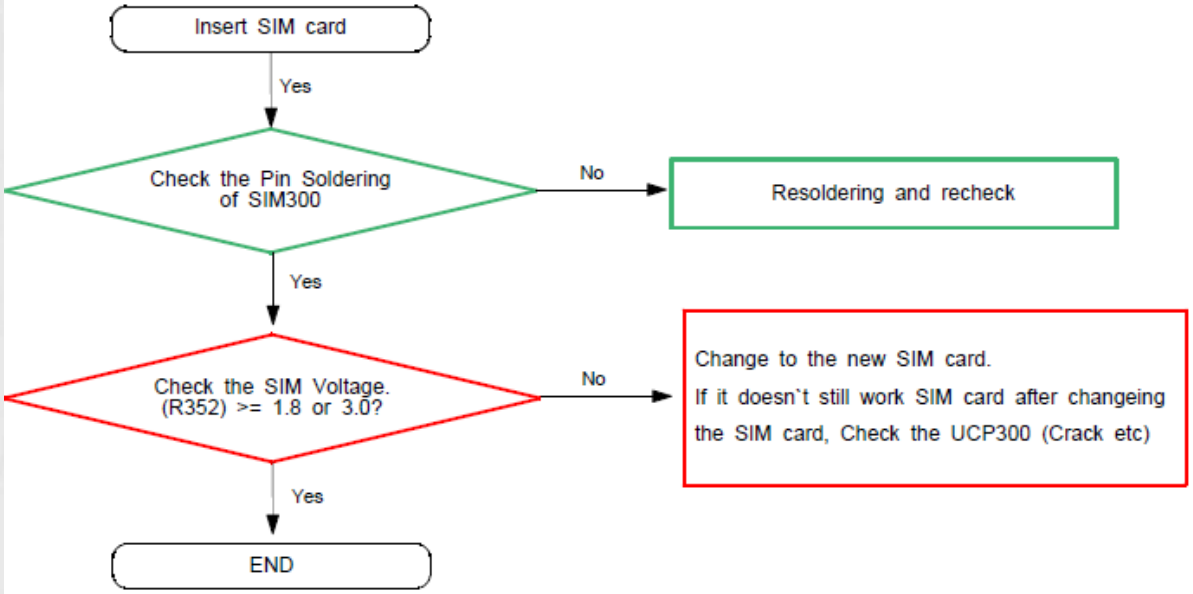


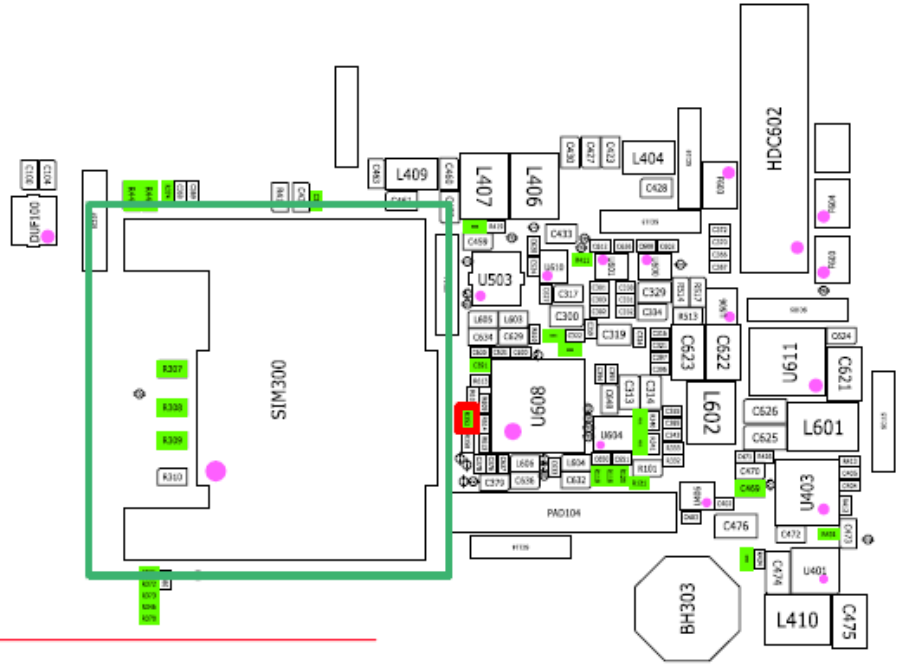
No service


No service
Yes
Check menu setting
Menu → Apps → Settings → More settings →
Mobile networks → Network mode → GSM/WCDMA(Auto mode)
Menu → Phone → Keypad →
*#1234# → check Phone version →
CP : I9105PXX or
CP : unknown
CP : I9105PXX
Check the connection of RF coaxial cable
(QCB01 @ page2)
CP : unknown
Check RFS100 is well soldered
No
Resolder or Change RFS100
Yes
Check RFS101, L102 and C106
is well soldered
No
Resolder or Change RFS101, L102 and C106
Abnormal
Change the Main Antenna
Abnormal
Change the board
Yes
END

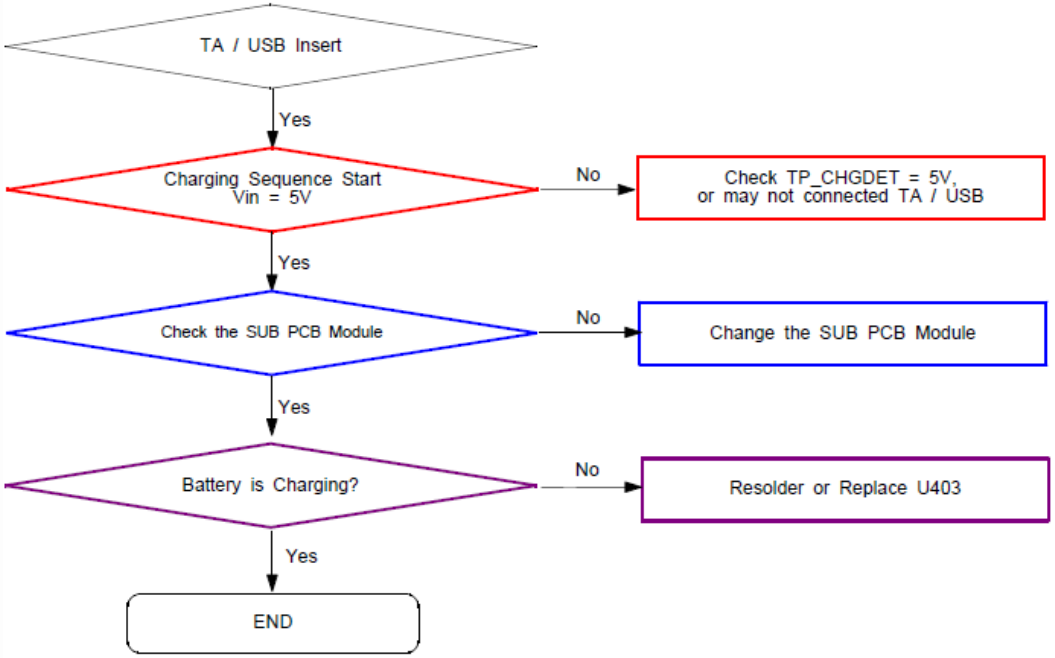

C106
L103
C113
C171
C137
C139
L137
C141
F100
C117
C114
C115
C156
C123
L108
RFS101
C109
L102
C116
CD300

SIM Part

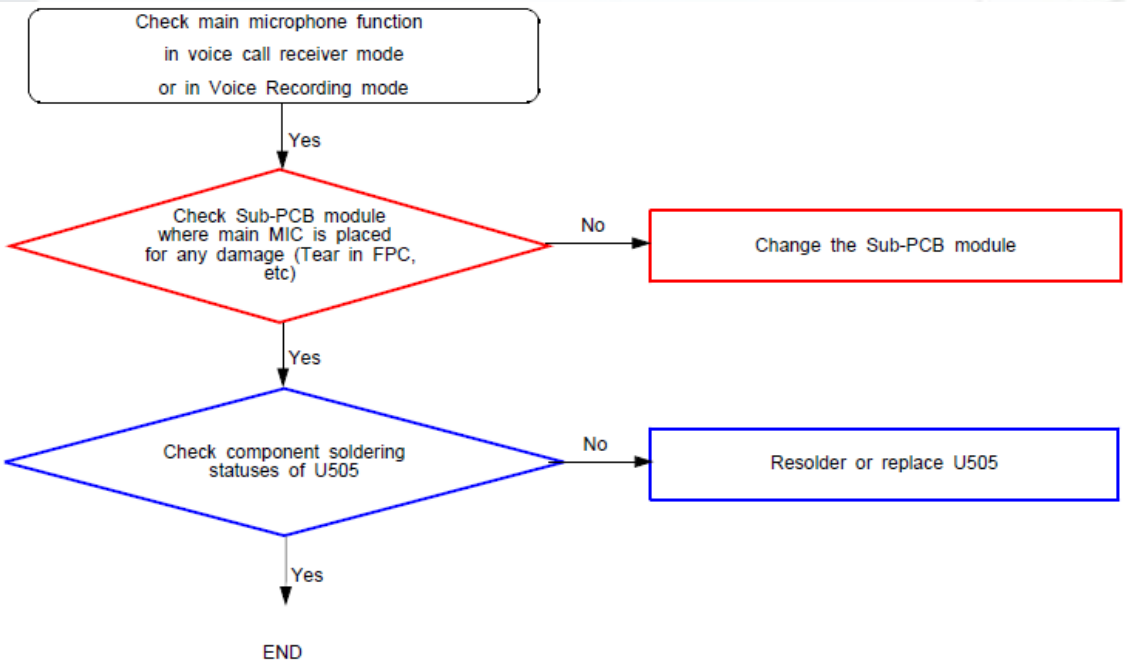

Insert SIM card
Yes
Check the Pin Soldering of SIM300
No
Resoldering and recheck
Yes
Check the SIM Voltage. (R352) >= 1.8 or 3.0?
No
Change to the new SIM card.
If it doesn`t still work SIM card after changeing the SIM card, Check the UCP300 (Crack etc)
Yes
END


SIM300
U503
U608
HDC602
L409
L407
L406
L404
L602
L601
U611
U403
U401
L410
BH303
PAD104
C476

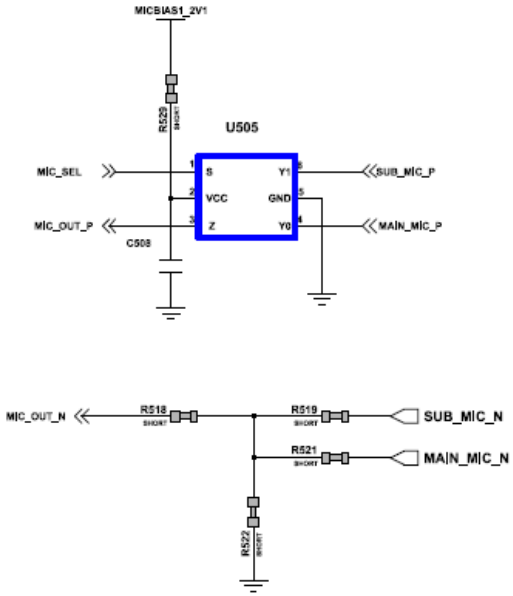
Charging Part



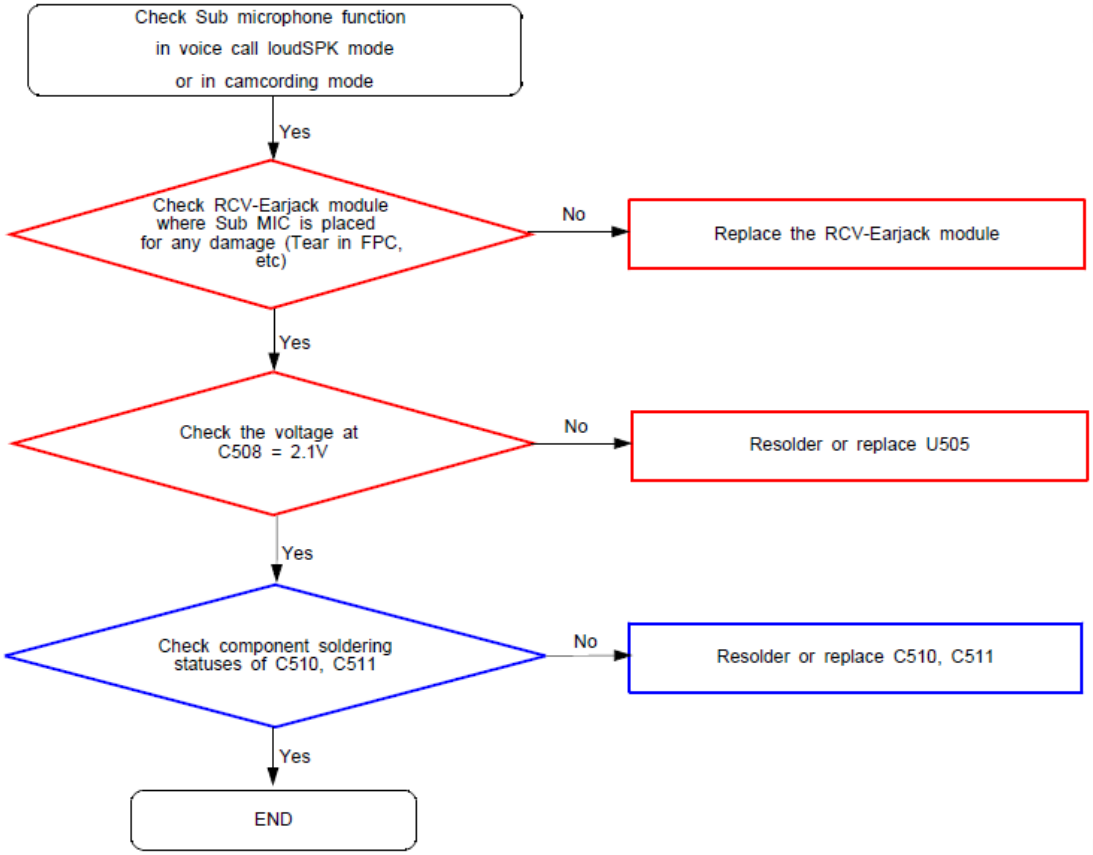
Main MIC

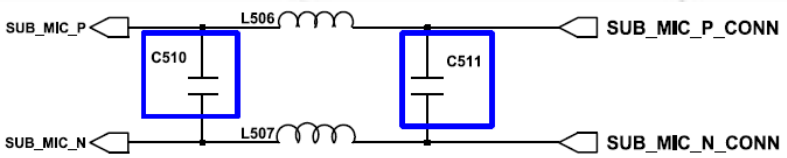

Check main microphone function
in voice call receiver mode
or in Voice Recording mode
Yes
Check Sub-PCB module where main MIC is placed for any damage (Tear in FPC, etc)
No
Change the Sub-PCB module
Yes
Check component soldering statuses of U505
No
Resolder or replace U505
Yes
END

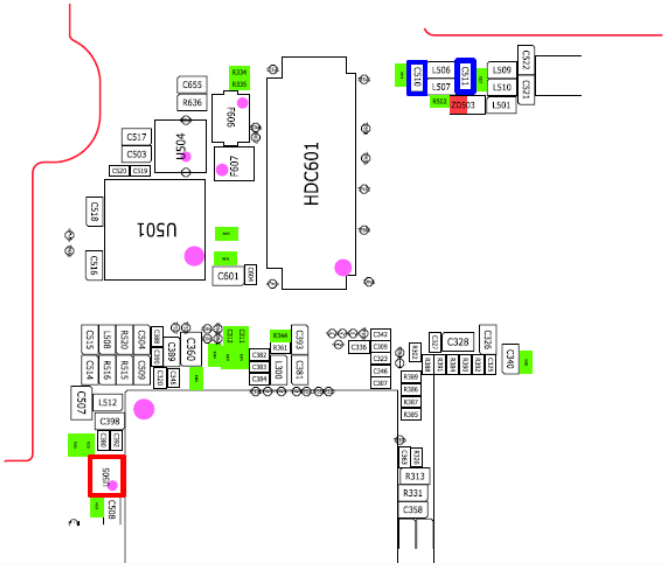
HDC601
U501
UCP300
UME300
VK500
ZD400
TA402
R402
U203
BTC400


MICBIAS1_2V1
R529
U505
MIC_SEL
MIC_OUT_P
C508
S
VCC
Z
Y1
GND
Y0
SUB_MIC_P
MAIN_MIC_P
MIC_OUT_N
R518
R519
R521
R522
SUB_MIC_N
MAIN_MIC_N

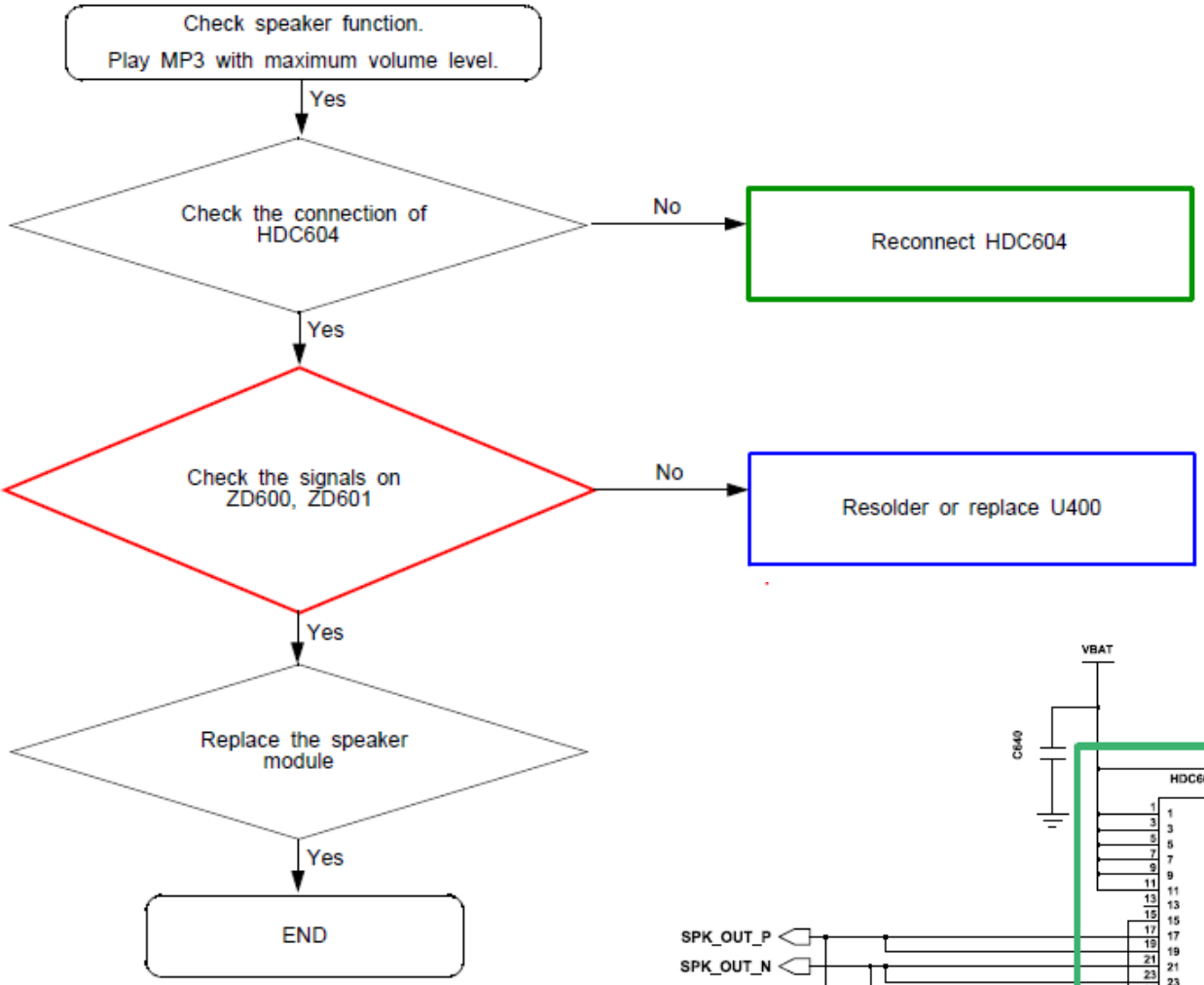
Sub MIC

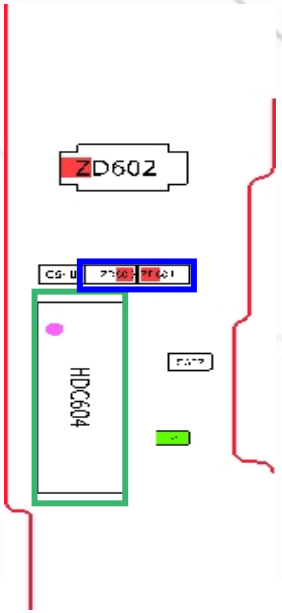

Check Sub microphone function
in voice call loudSPK mode
or in camcording mode
Yes
Check RCV-Earjack module where Sub MIC is placed for any damage (Tear in FPC, etc)
No
Replace the RCV-Earjack module
Yes
Check the voltage at C508 = 2.1V
No
Resolder or replace U505
Yes
Check component soldering statuses of C510, C511
No
Resolder or replace C510, C511
Yes
END

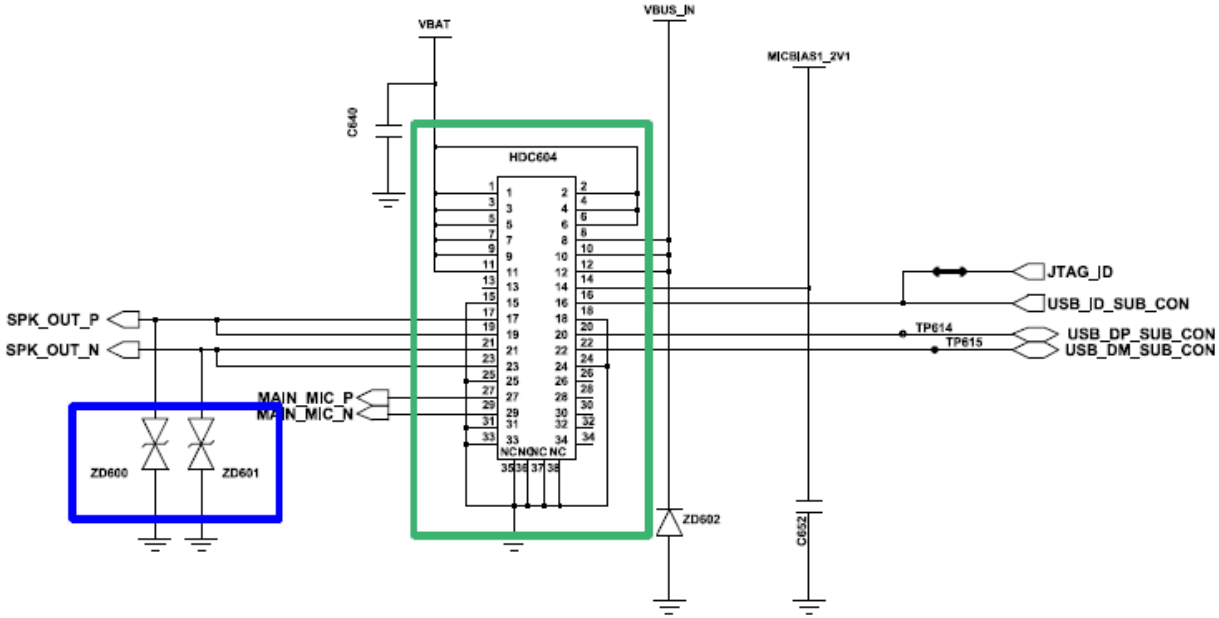

SUB_MIC_P
L506
C510
C511
SUB_MIC_P_CONN
SUB_MIC_N
L507
SUB_MIC_N_CONN


HDC601
U501
U504

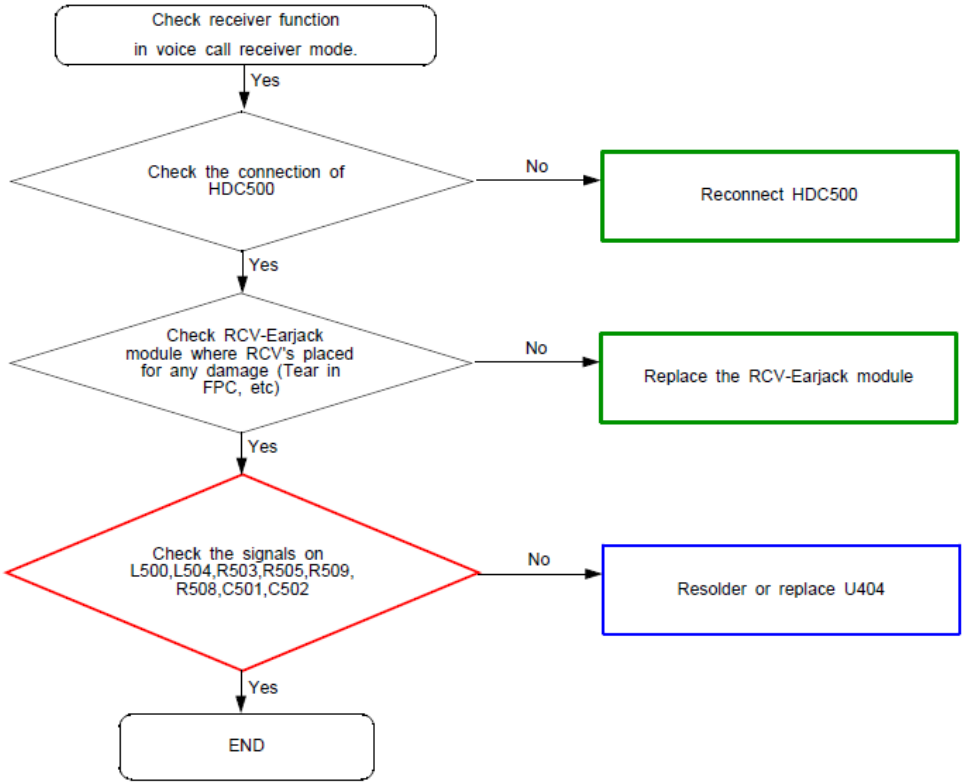
Speaker


Check speaker function.
Play MP3 with maximum volume level.
Yes
Check the connection of HDC604
No
Reconnect HDC604
Yes
Check the signals on ZD600, ZD601
No
Resolder or replace U400
Yes
Replace the speaker module
Yes
END


ZD602
HDC604

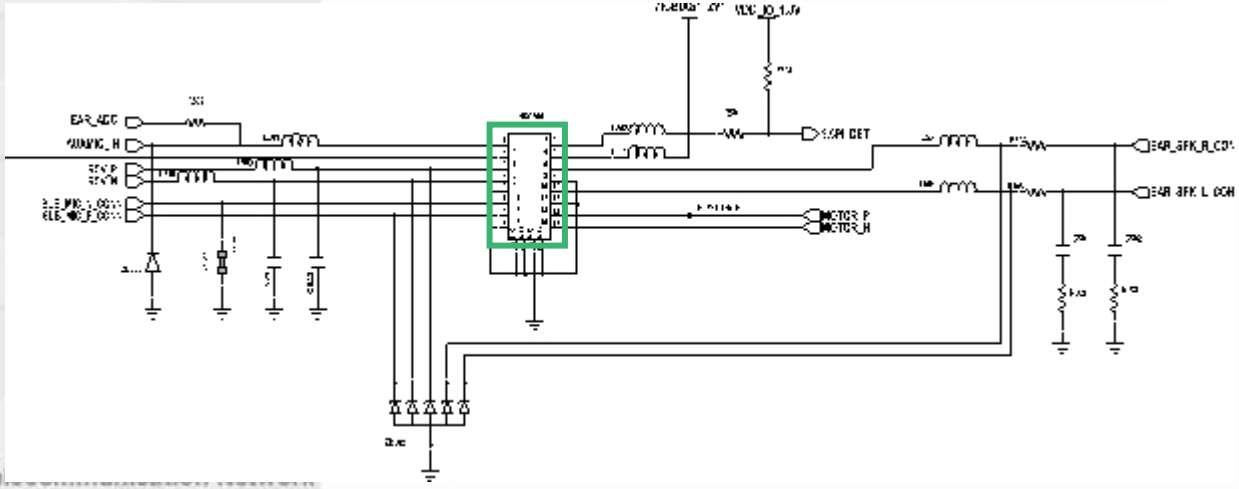

VBAT
VBUS_IN
MICBIAS1_2V1
C640
HDC604
SPK_OUT_P
SPK_OUT_N
MAIN_MIC_P
MAIN_MIC_N
ZD600
ZD601
ZD602
C652
JTAG_ID
USB_ID_SUB_CON
TP614
TP615
USB_DP_SUB_CON
USB_DM_SUB_CON

Receiver

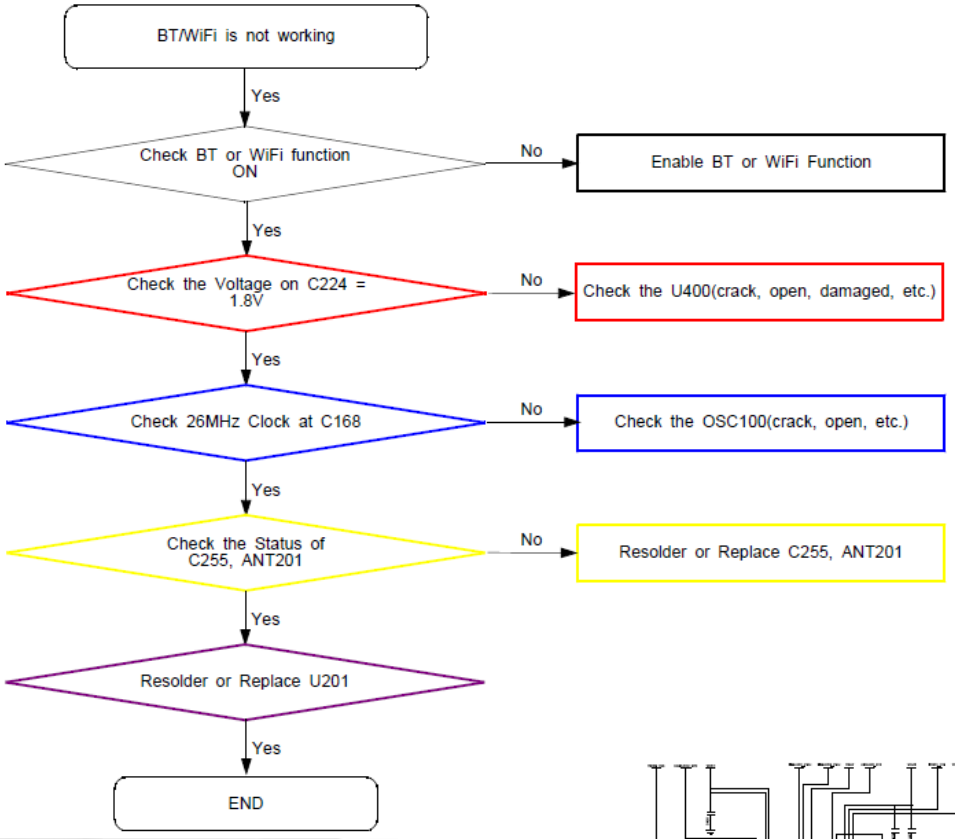

Check receiver function
in voice call receiver mode.
Yes
Check the connection of HDC500
No
Reconnect HDC500
Yes
Check RCV-Earjack module where RCV's placed for any damage (Tear in FPC, etc)
No
Replace the RCV-Earjack module
Yes
Check the signals on L500,L504,R503,R505,R509, R508,C501,C502
No
Resolder or replace U404
Yes
END

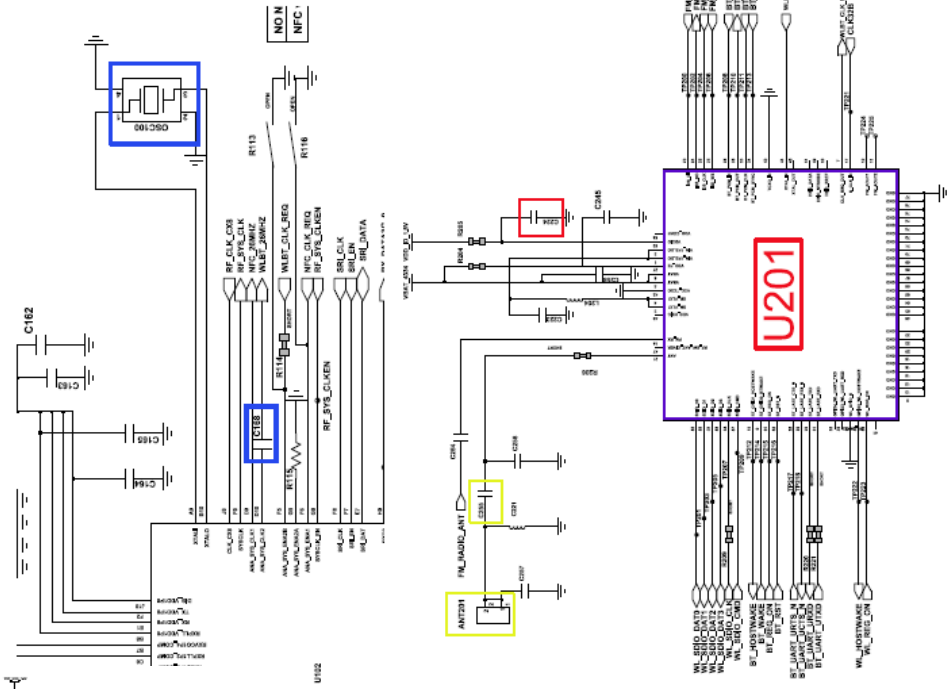
HDC500
HDC600
L403
LED400
L400
L402
L405
L40
L44

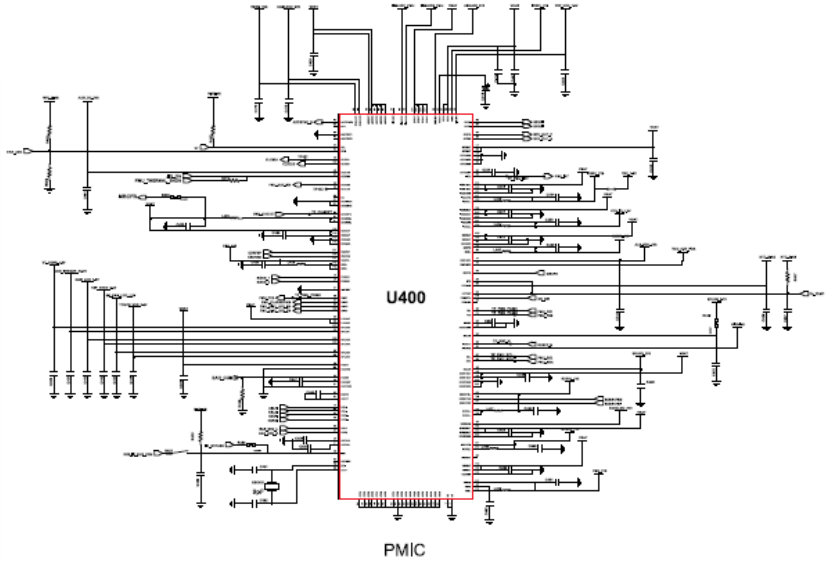
L500
T500


EAR_ADC
SPK_P
SPK_N
MOTOR_P
MOTOR_N

BT/WiFi

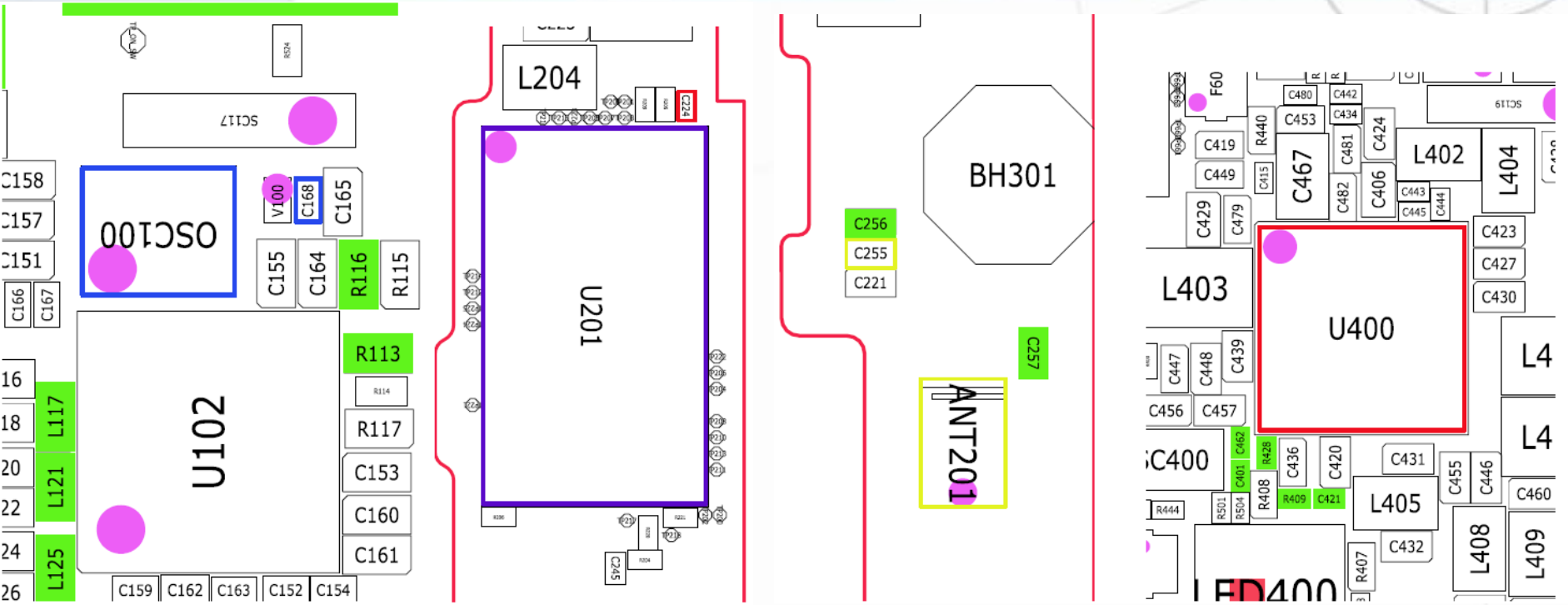




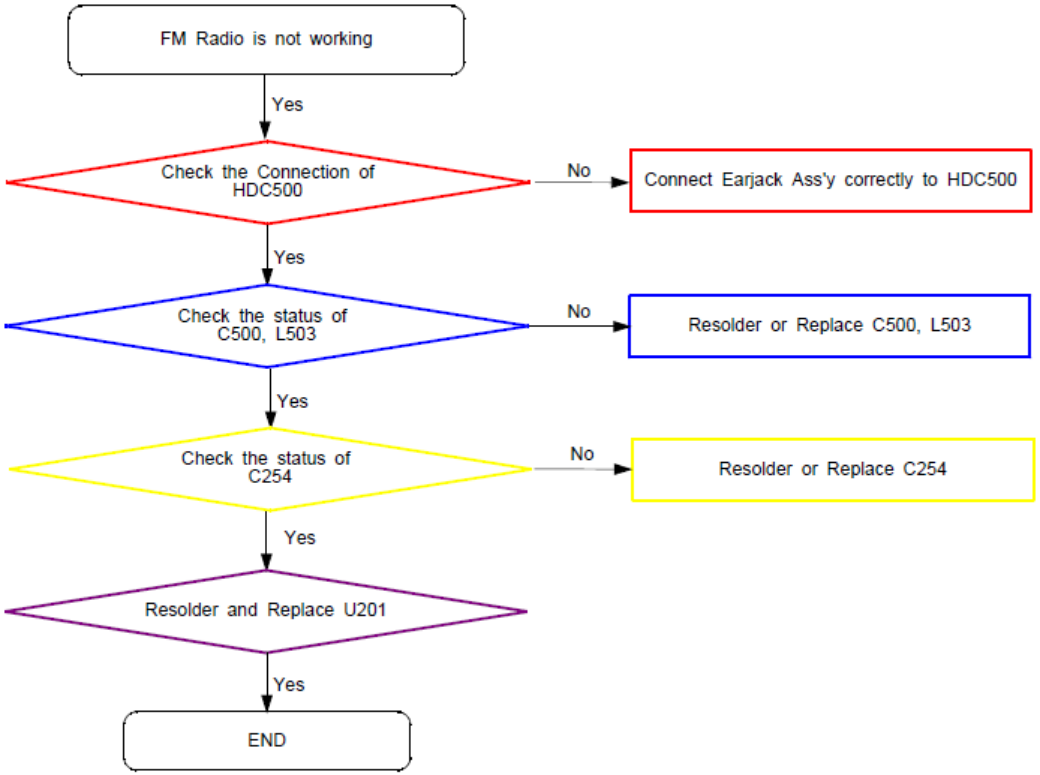


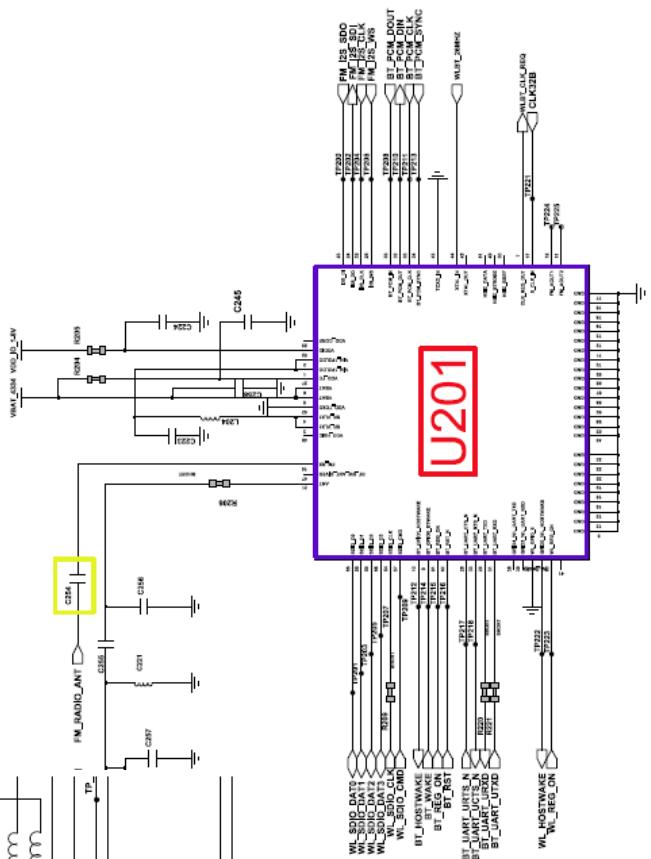
Telecommunication Network

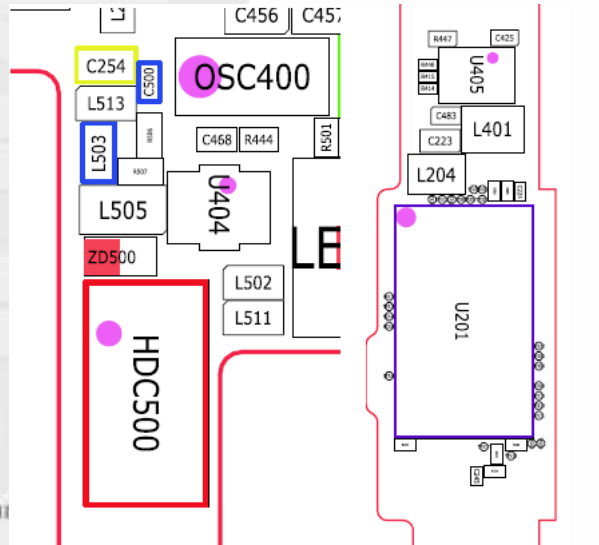
BT/WiFi

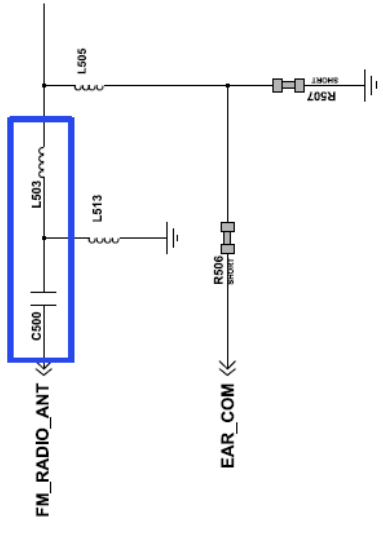

OSC100
V100
C168
C165
C155
C164
R116
R115
C158
C157
C151
C166
C167
U102
R113
R114
R117
C153
C160
C161
L117
L121
L125
C159
C162
C163
C152
C154
L204
C224
U201
C256
C255
C221
BH301
C257
ANT201
F60
C480
C442
C453
C434
C440
C419
C449
C467
C481
C424
C406
C482
C443
C445
C444
L402
L404
C429
C479
C423
C427
C430
L403
U400
C447
C448
C439
C456
C457
C462
C428
C436
C420
C431
C455
C446
C460
C401
R408
R409
C421
L405
R444
R501
R504
C432
L408
L409
R407

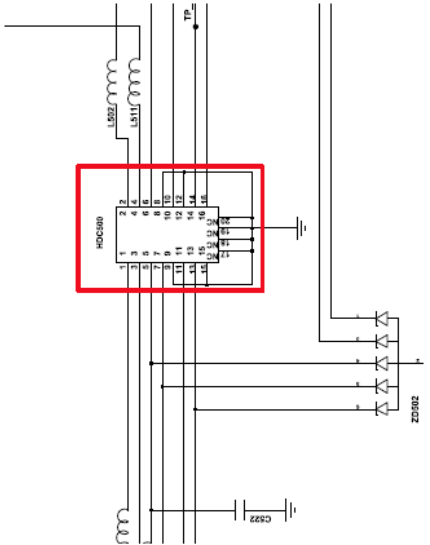
FM Radio


FM Radio is not working
Yes
Check the Connection of HDC500
No
Connect Earjack Ass'y correctly to HDC500
Yes
Check the status of C500, L503
No
Resolder or Replace C500, L503
Yes
Check the status of C254
No
Resolder or Replace C254
Yes
Resolder and Replace U201
Yes
END

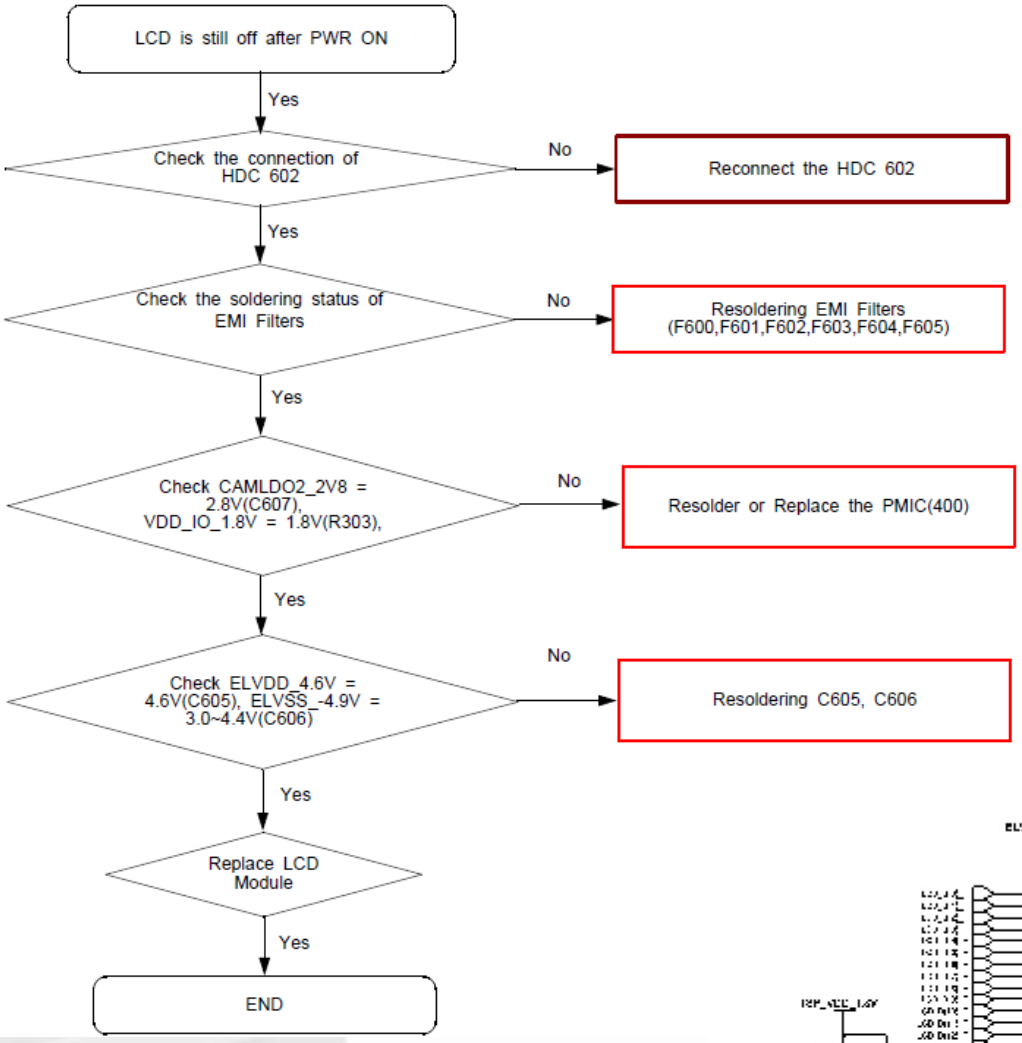

U201

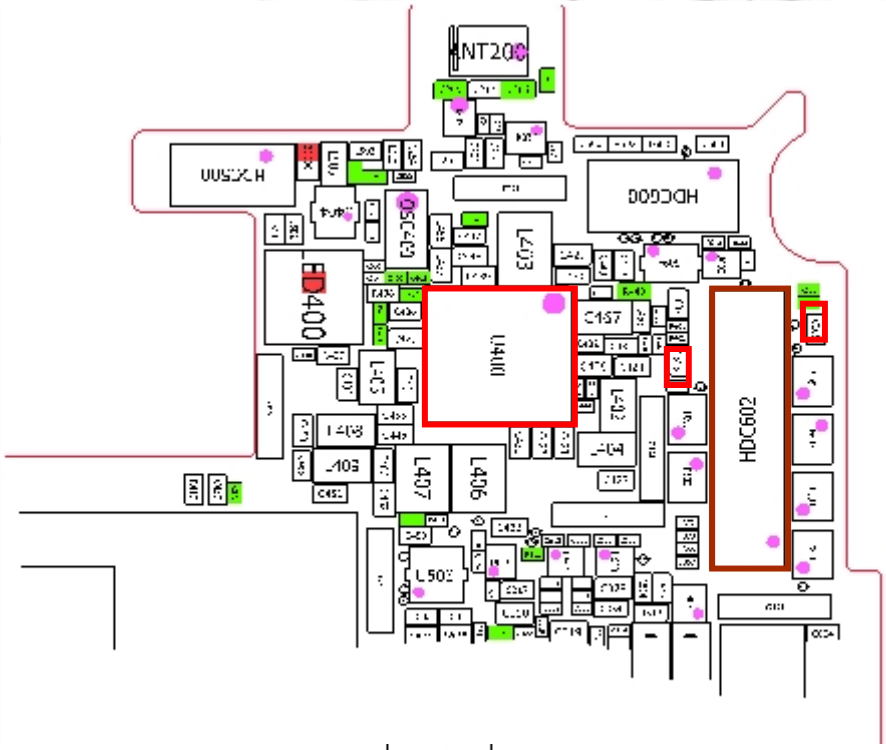

C254
OSC400
L513
C500
L503
C468
R444
R501
L505
U404
ZD500
L502
L511
HDC500
U405
L401
C483
C223
L204
U201

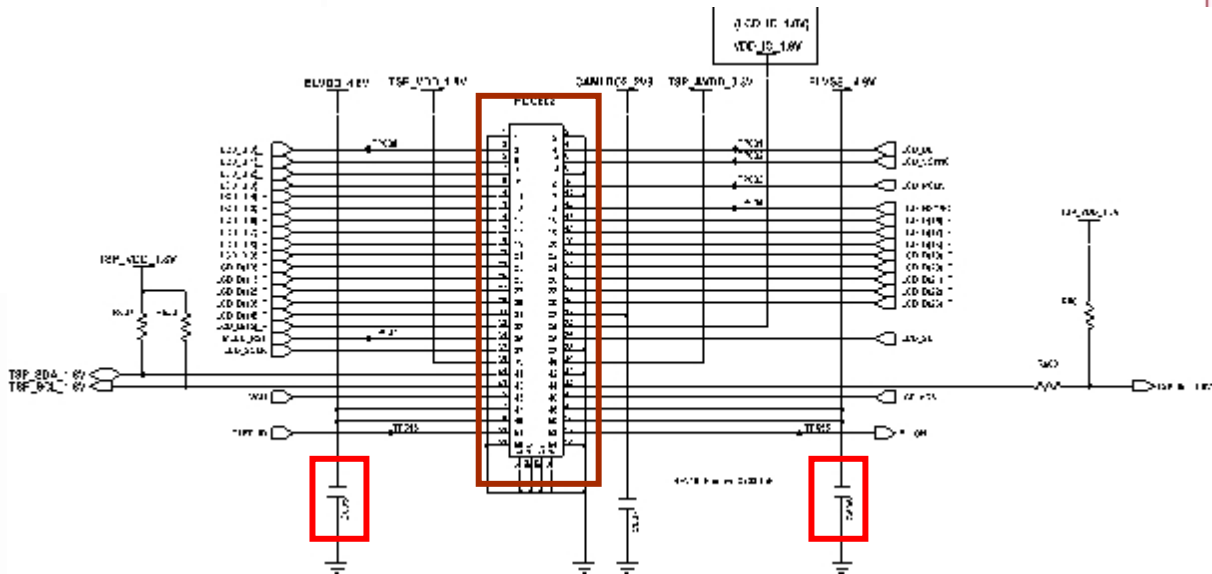

L505
R507
L503
L513
C500
R506
FM_RADIO_ANT
EAR_COM


HDC500
ZD502

LCD

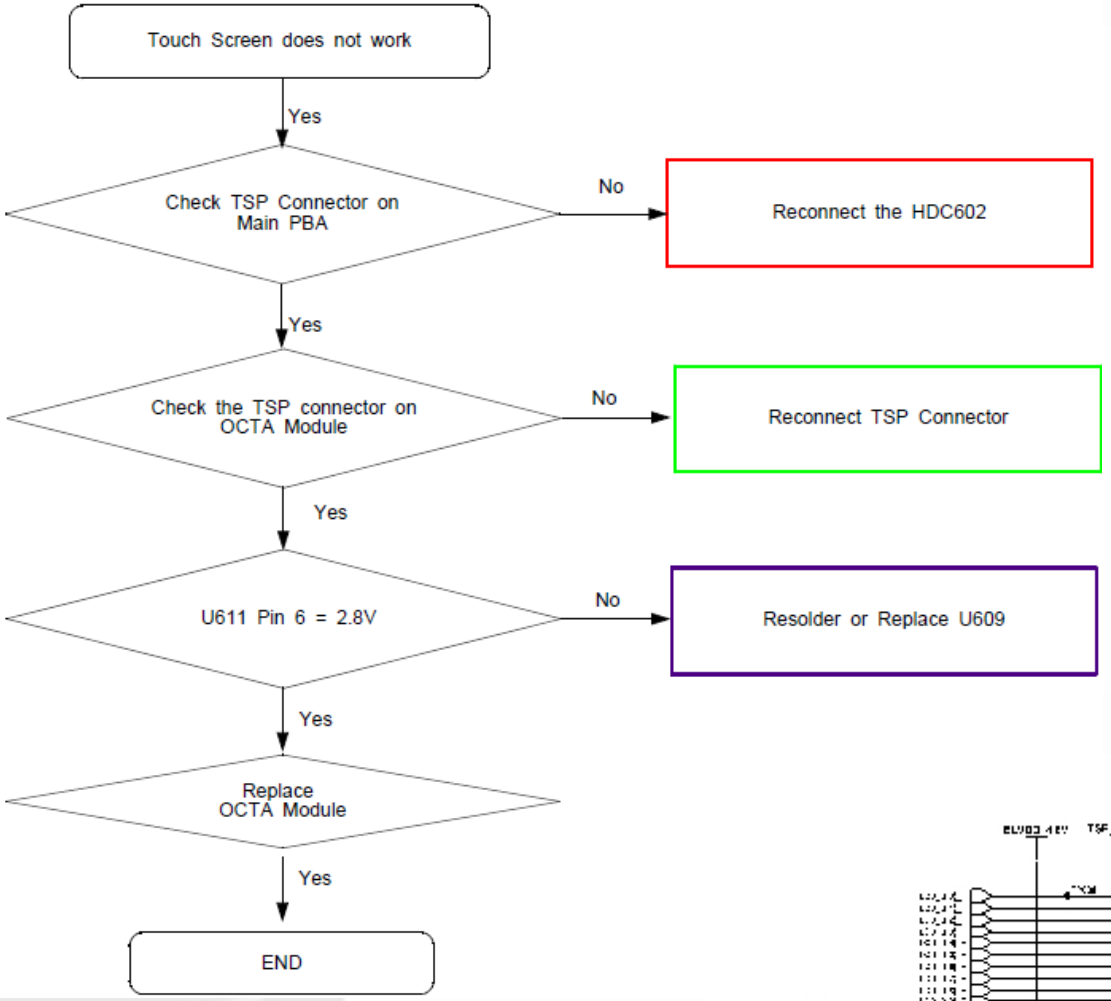


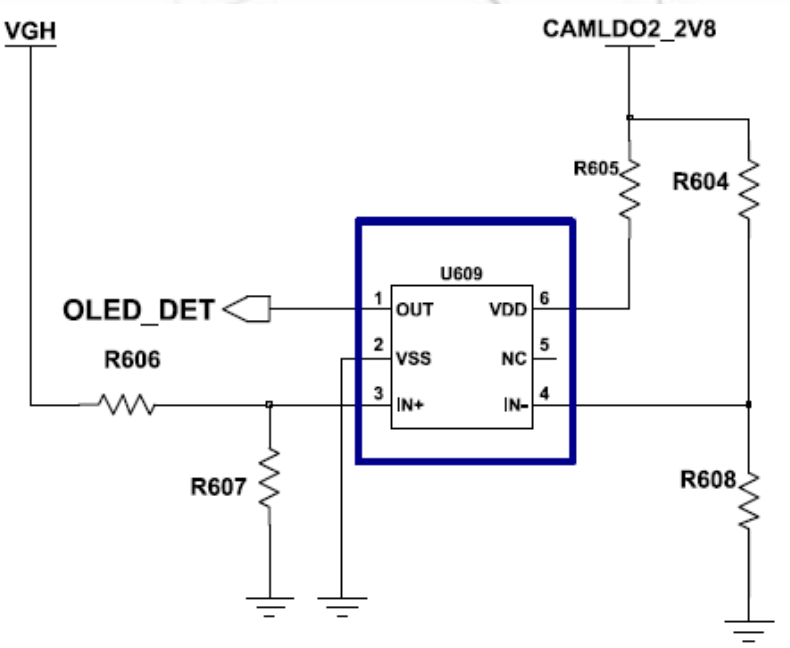


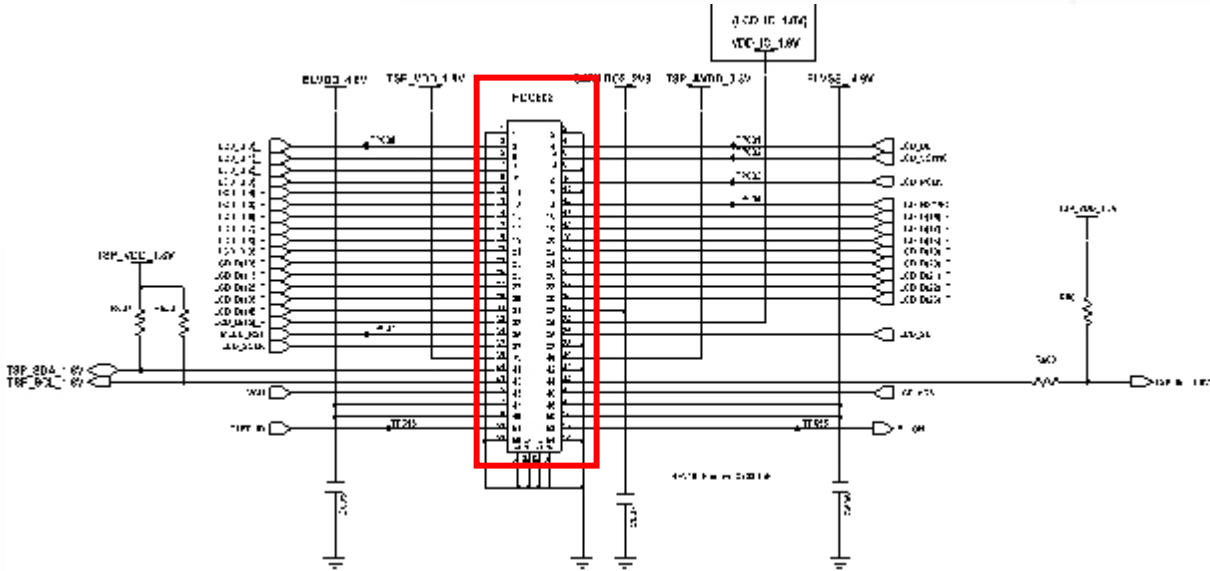


Telecommunication Network

TSP

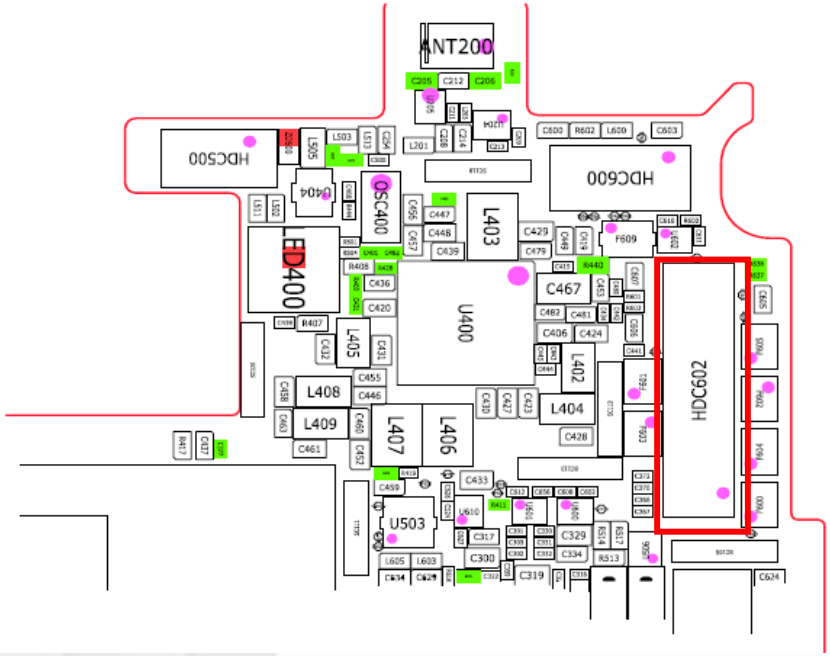


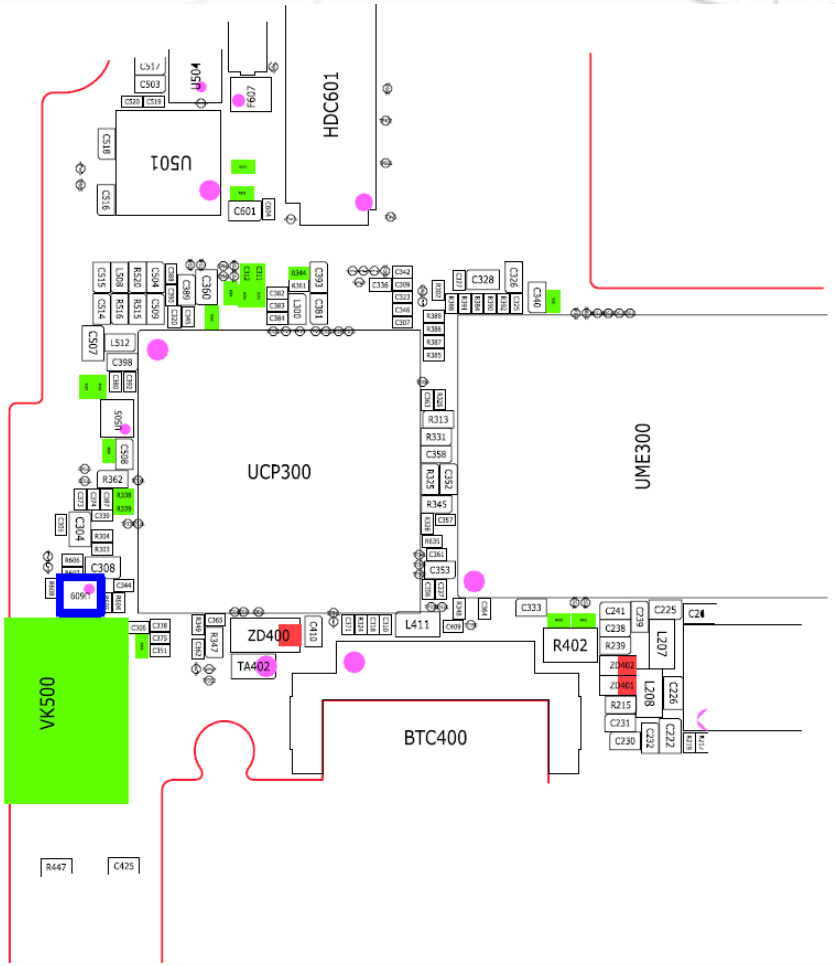




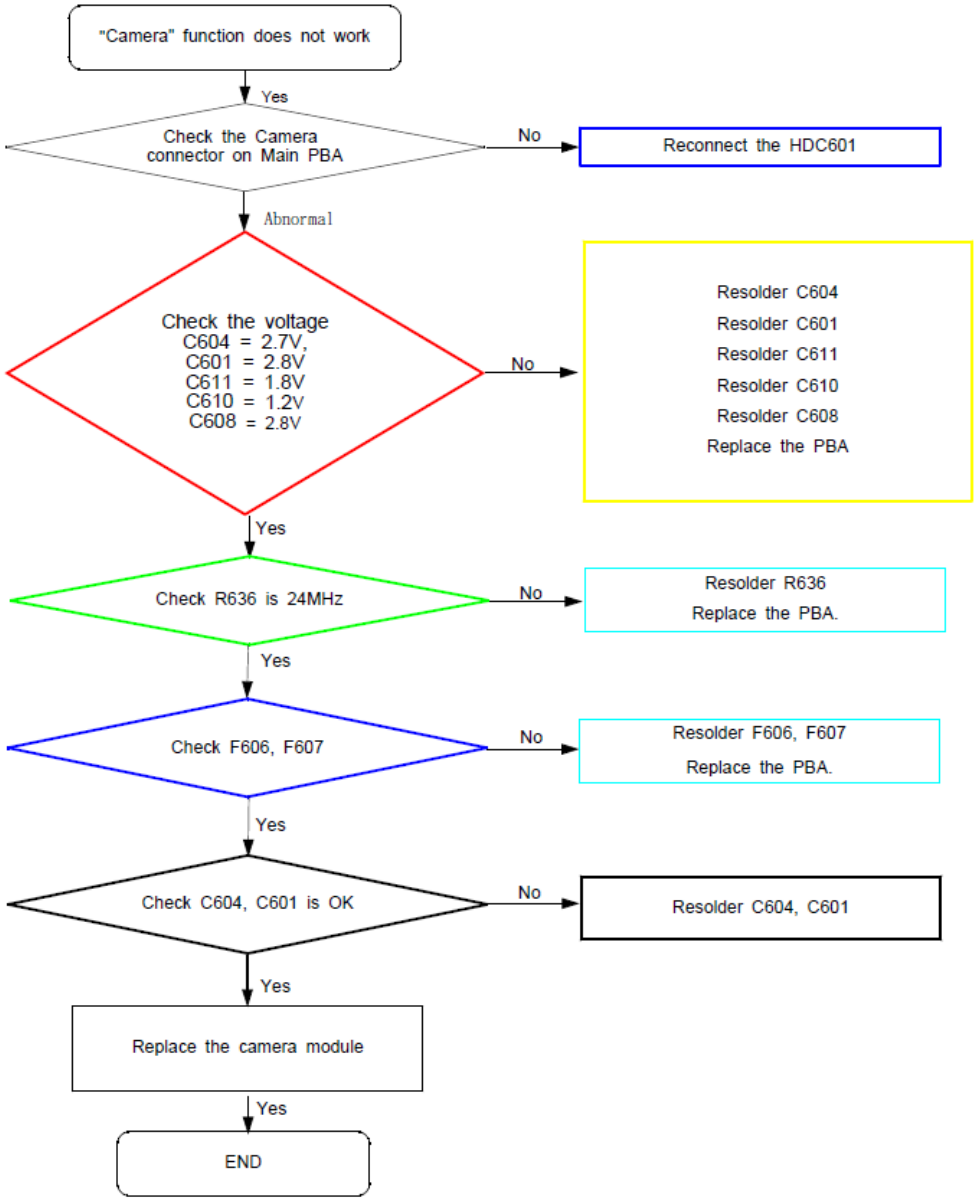
Telecommunication Network

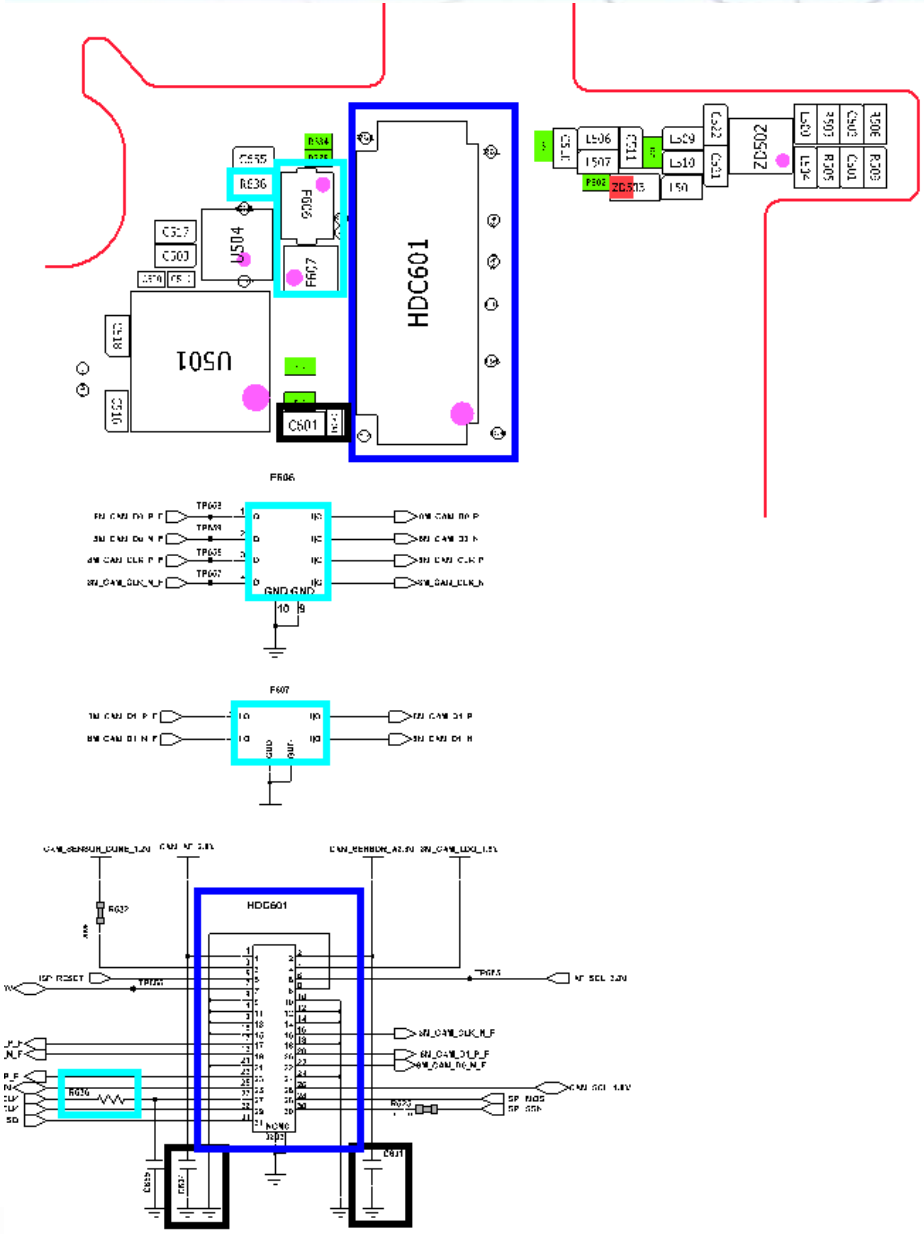
TSP


ANT200
HDC500
HDC600
OSC400
ED400
L403
U400
C467
HDC602
L405
L408
L409
L407
L406
L402
L404
U503

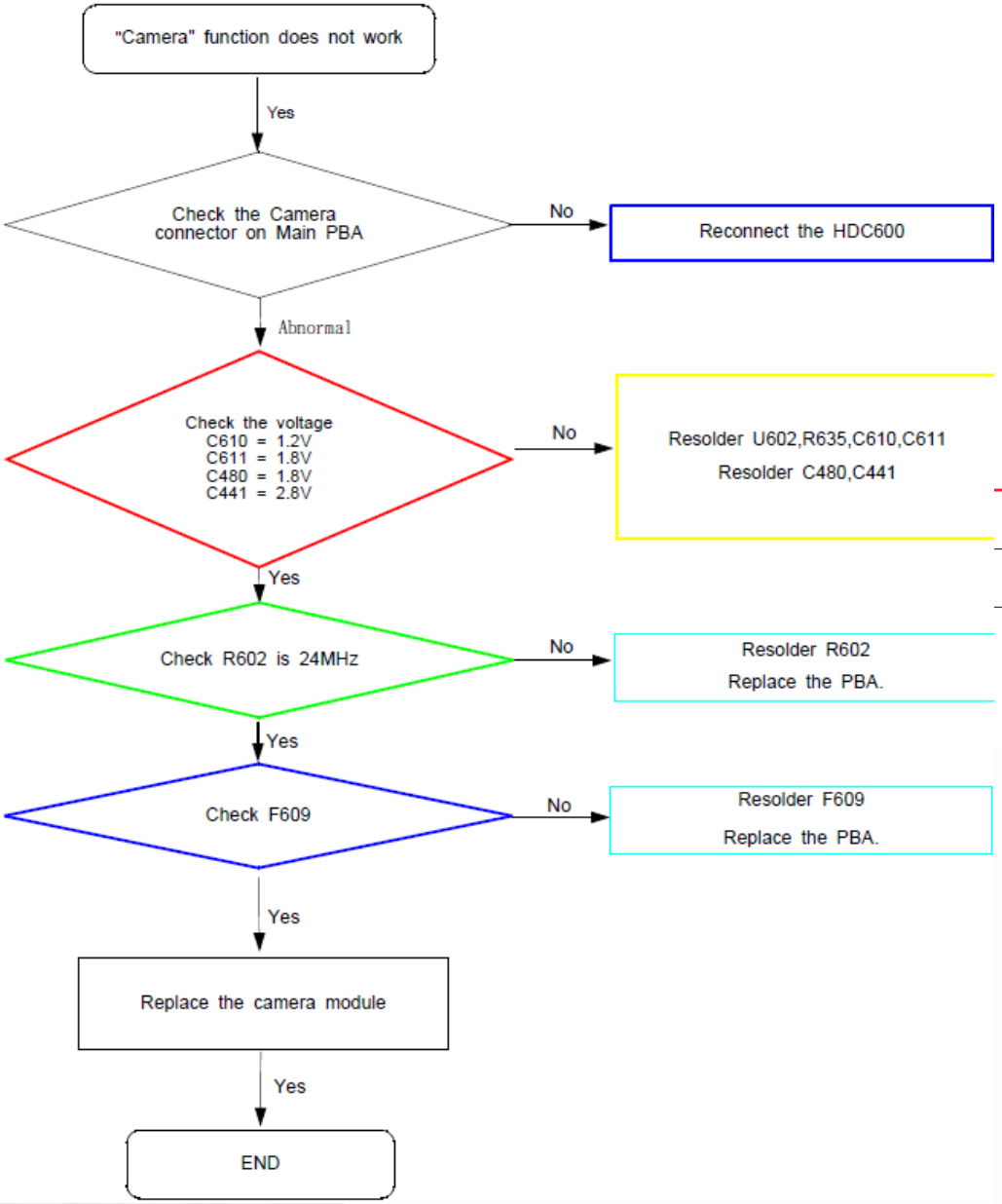

HDC601
U501
UCP300
UME300
VK500
ZD400
TA402
L411
R402
BTC400

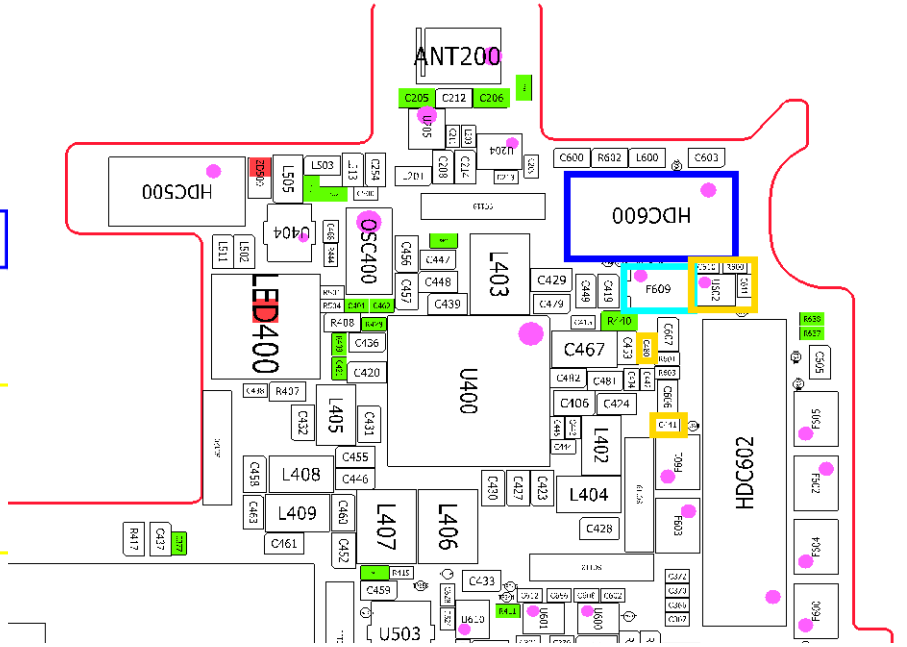
8M CAM

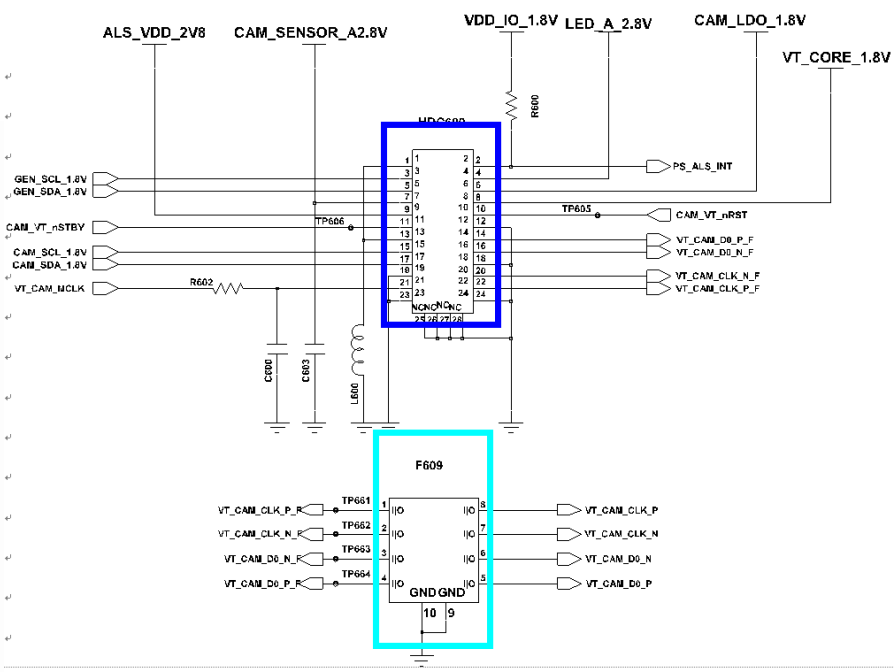

"Camera" function does not work
Yes
Check the Camera connector on Main PBA
No
Reconnect the HDC601
Abnormal
Check the voltage
C604 = 2.7V,
C601 = 2.8V
C611 = 1.8V
C610 = 1.2V
C608 = 2.8V
No
Resolder C604
Resolder C601
Resolder C611
Resolder C610
Resolder C608
Replace the PBA
Yes
Check R636 is 24MHz
No
Resolder R636
Replace the PBA.
Yes
Check F606, F607
No
Resolder F606, F607
Replace the PBA.
Yes
Check C604, C601 is OK
No
Resolder C604, C601
Yes
Replace the camera module
Yes
END


HDC601
U504
U501
F606
F607
C601
R636
F606
F607
HDC601
R636

2M CAM

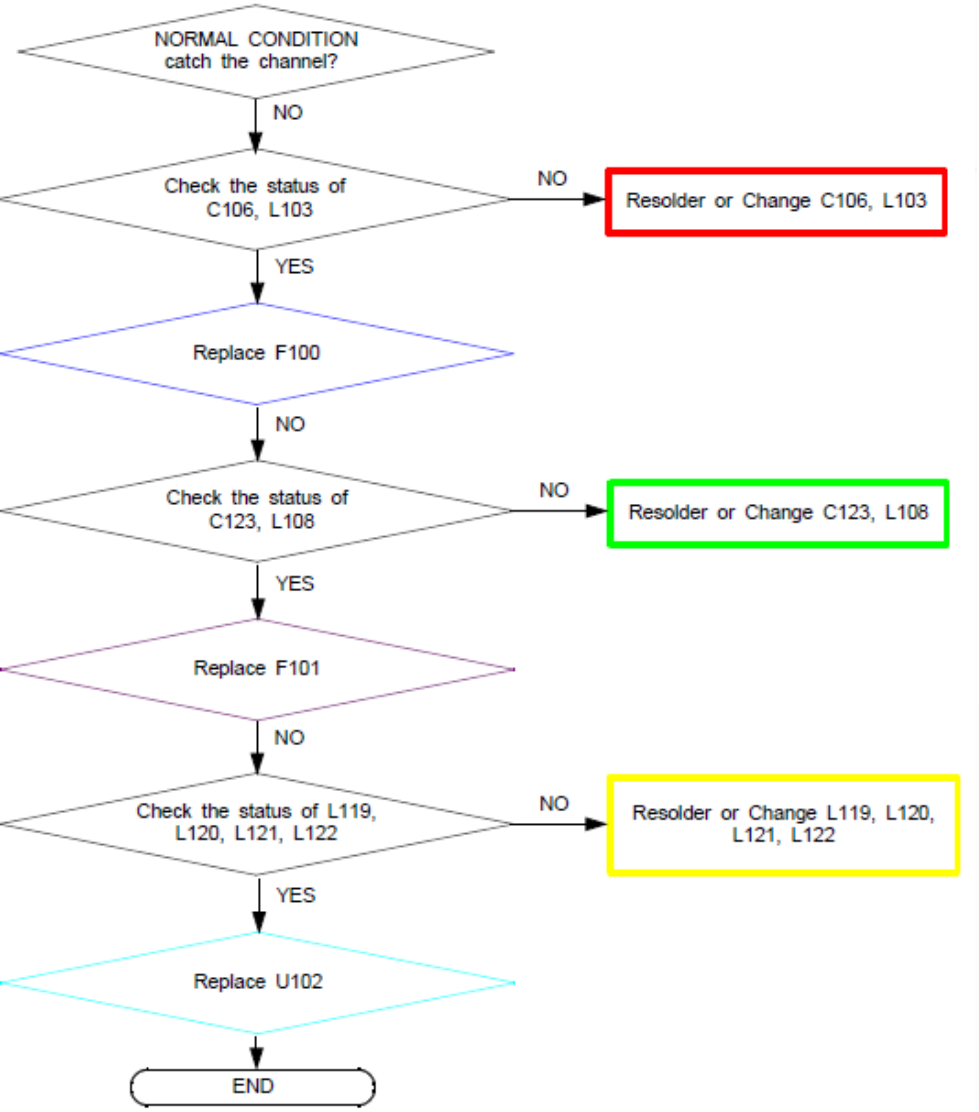


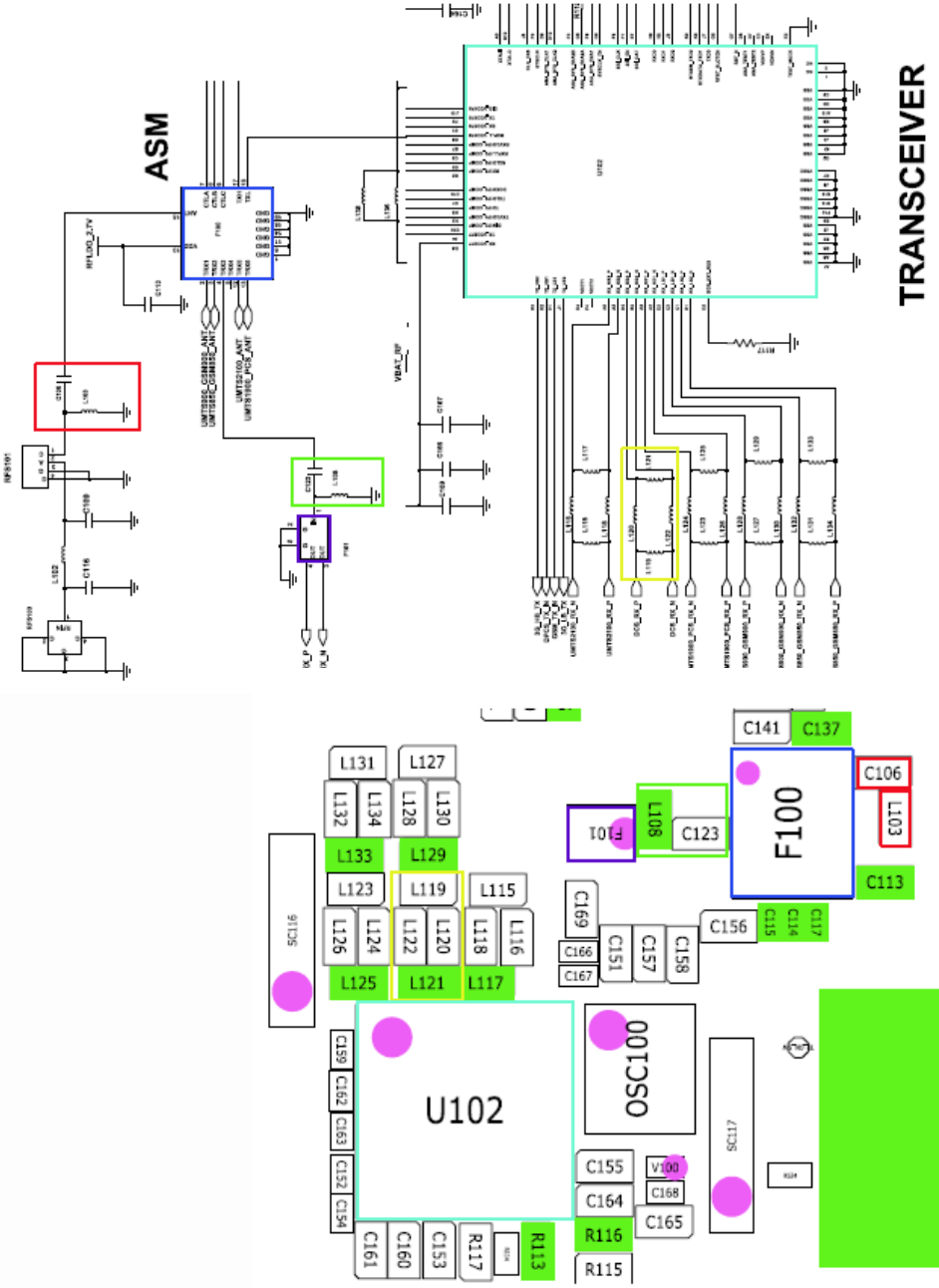




Telecommunication Network

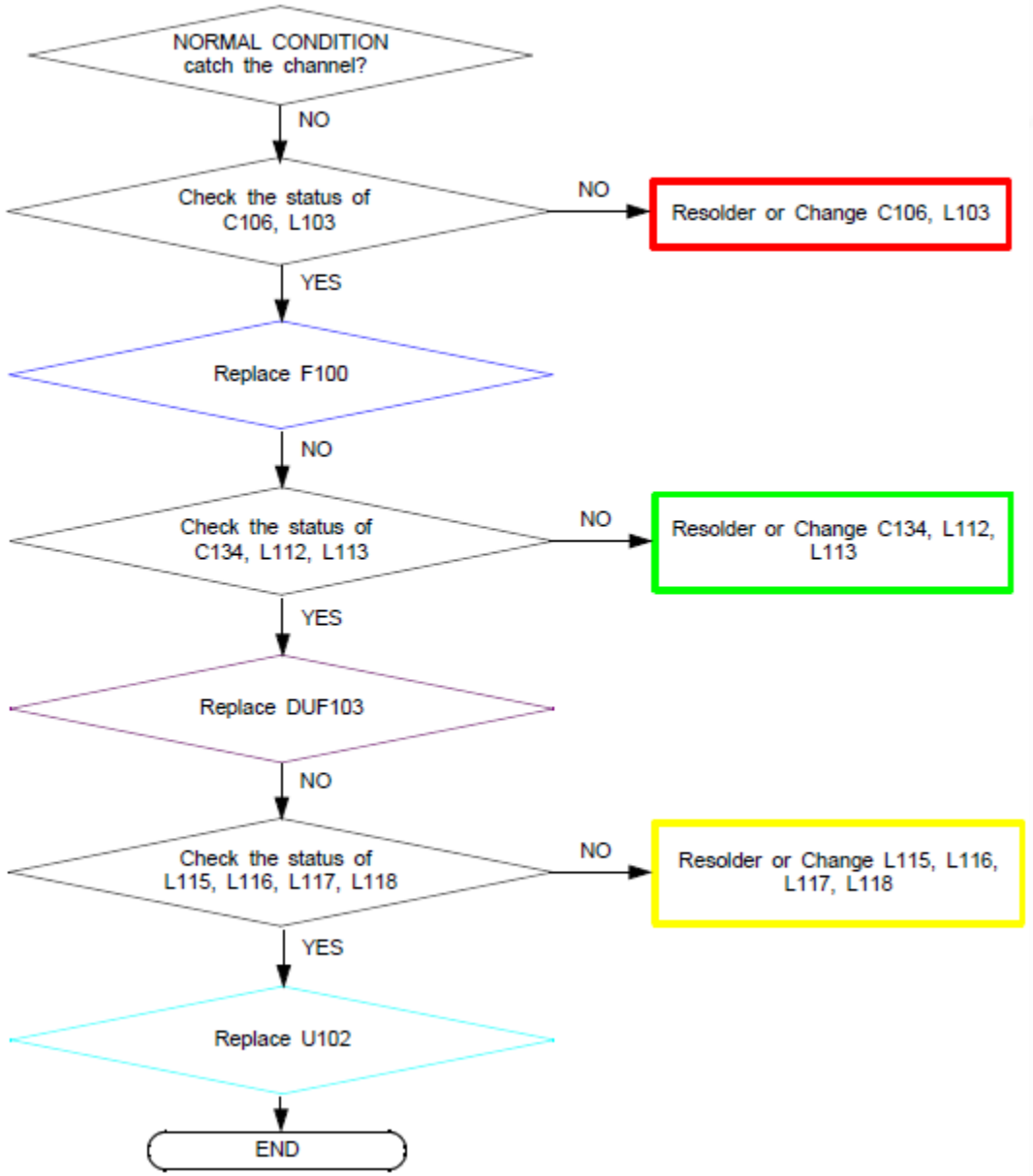
GSM1800 RX

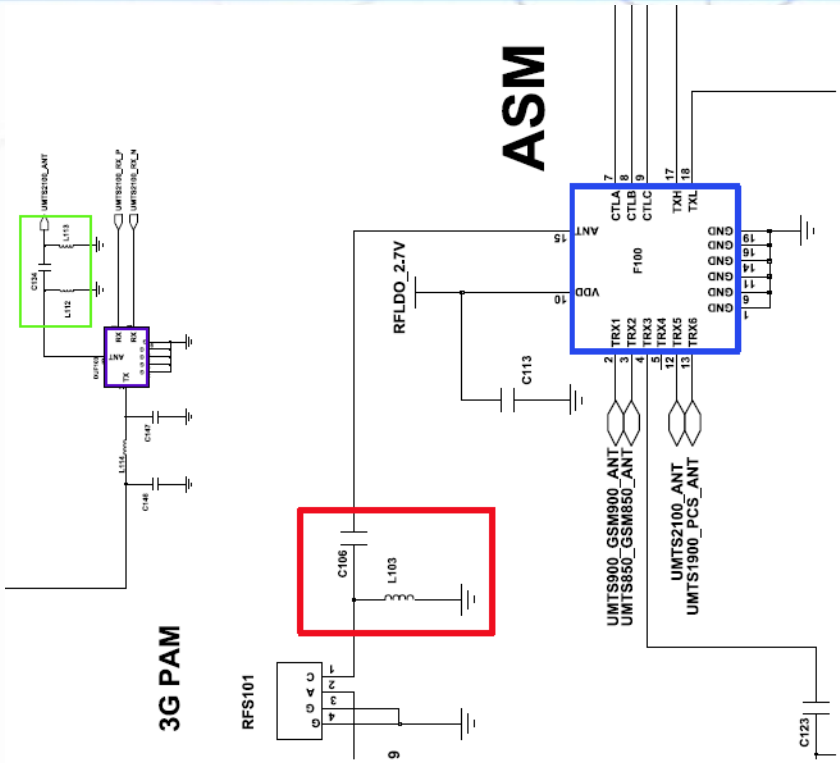




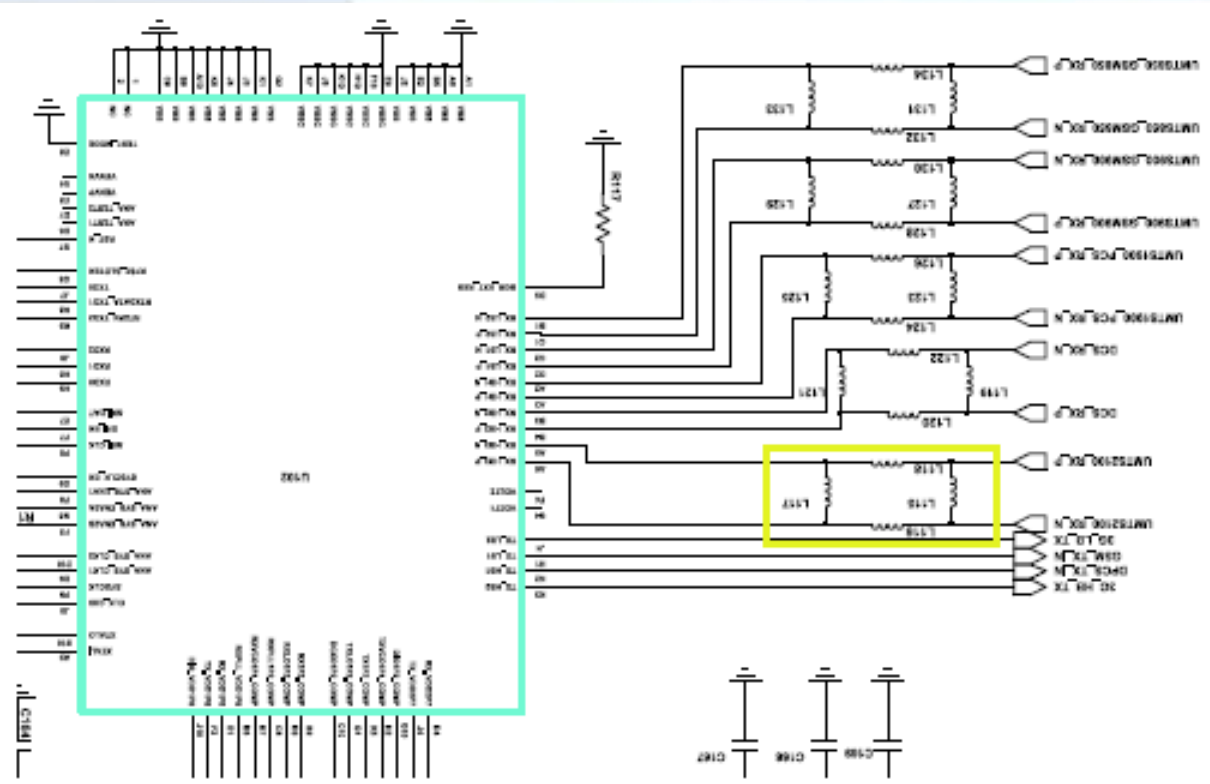
Telecommunication Network

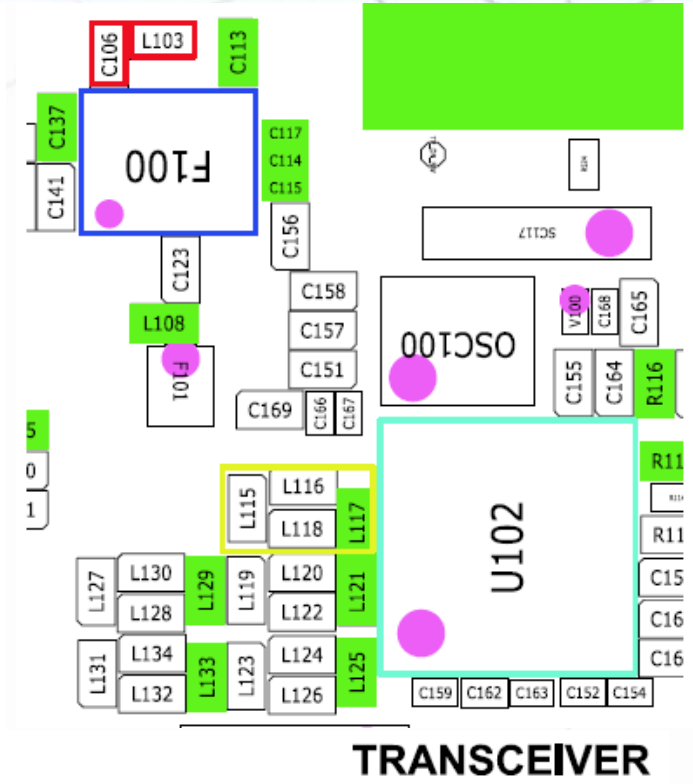
WCDMA Band1 Rx

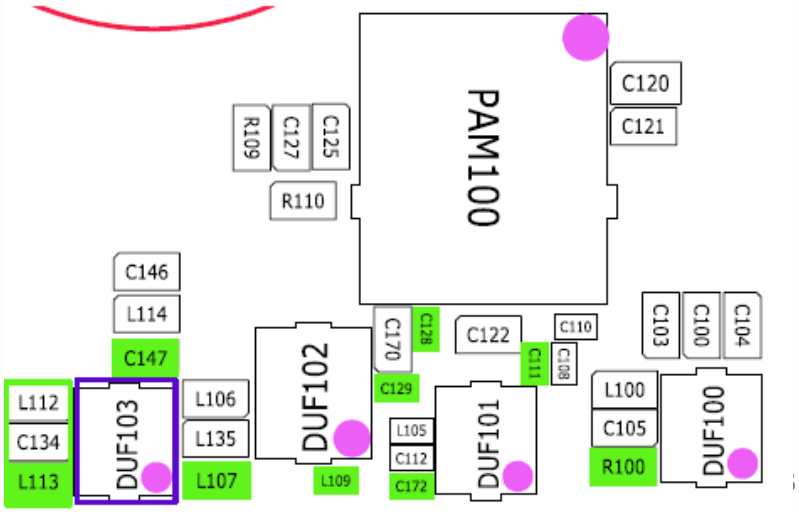




WCDMA Band1 Rx

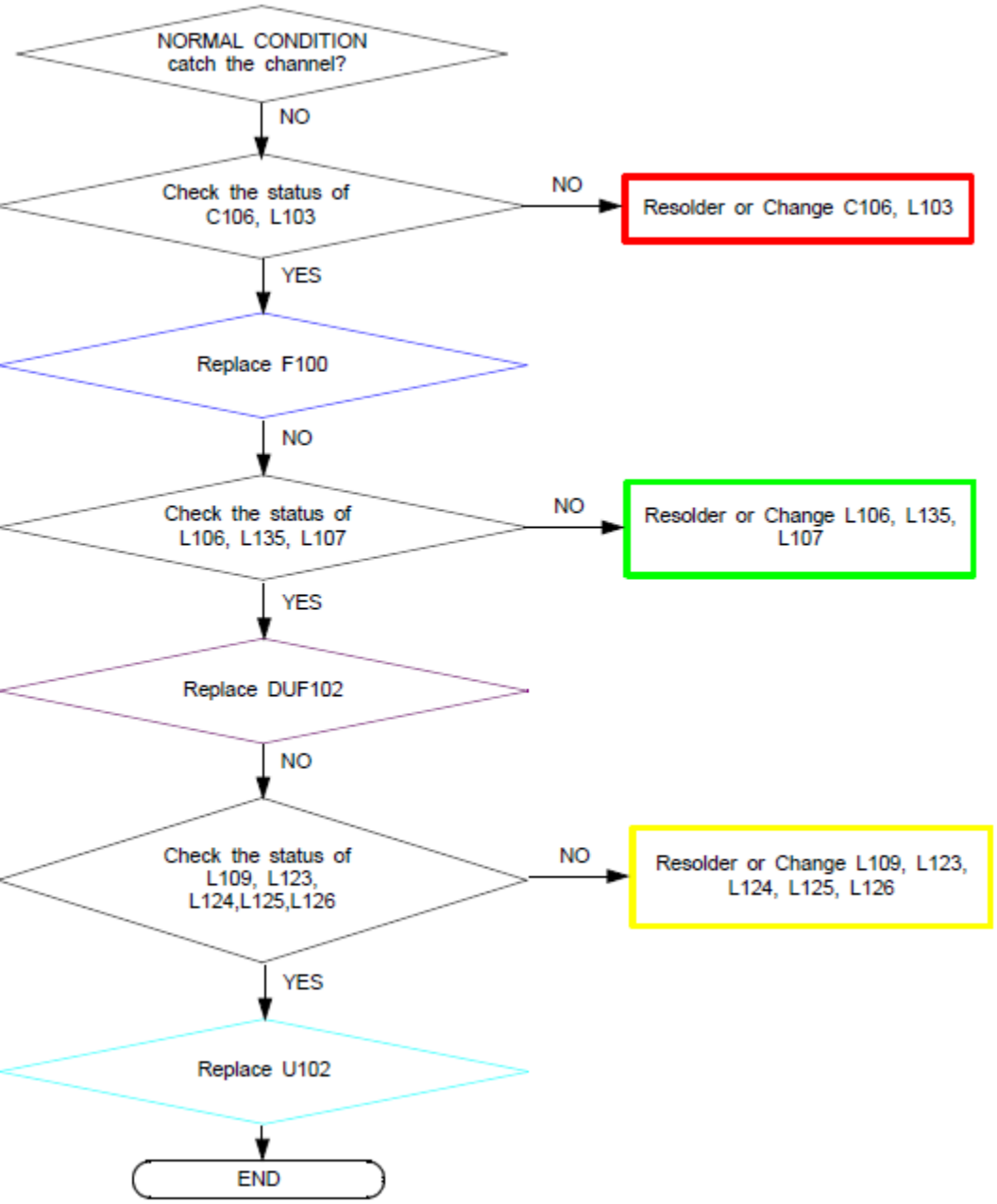


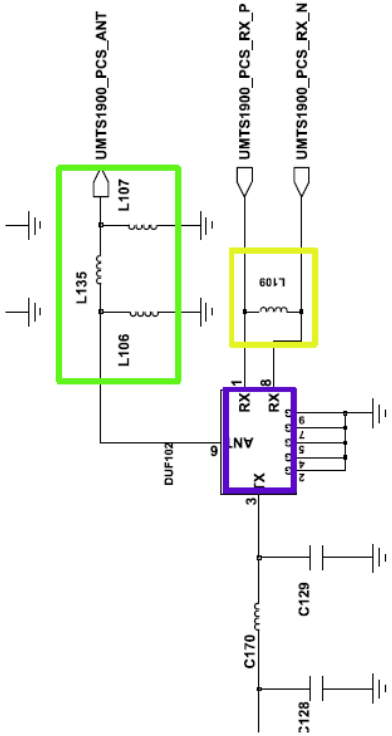


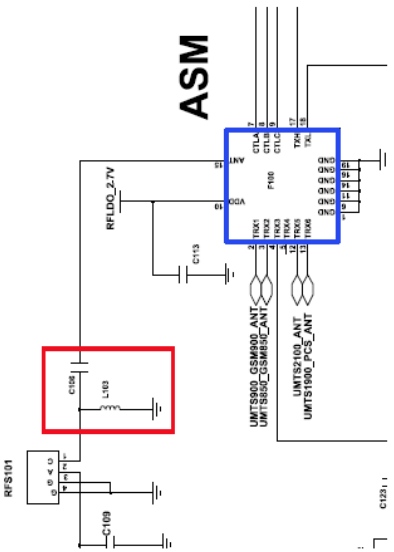


Telecommunication Network

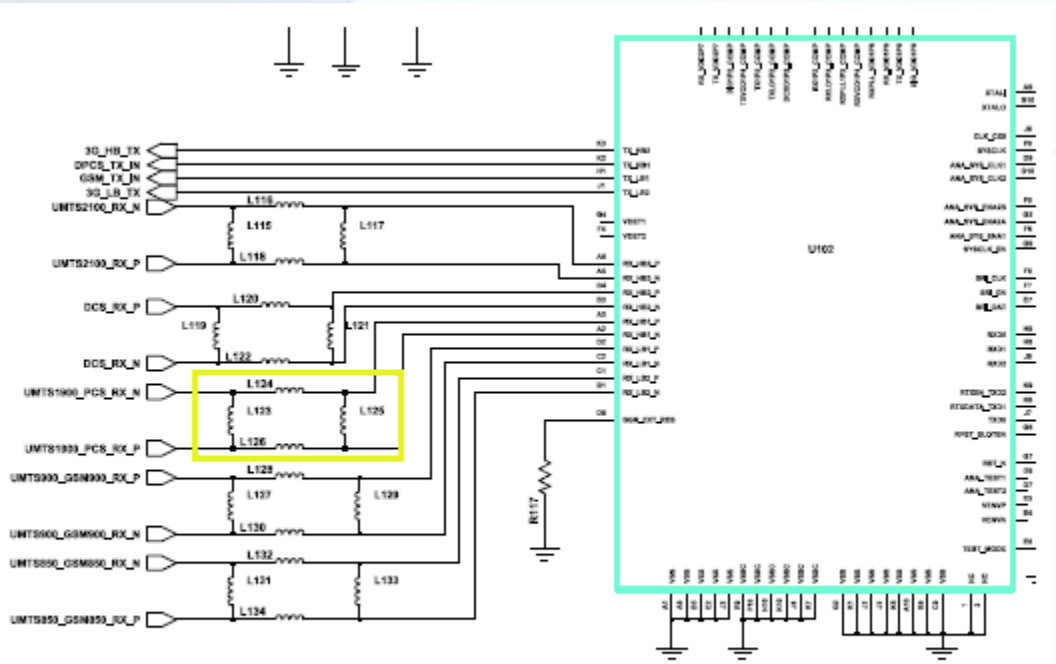
WCDMA Band2/GSM1900 RX



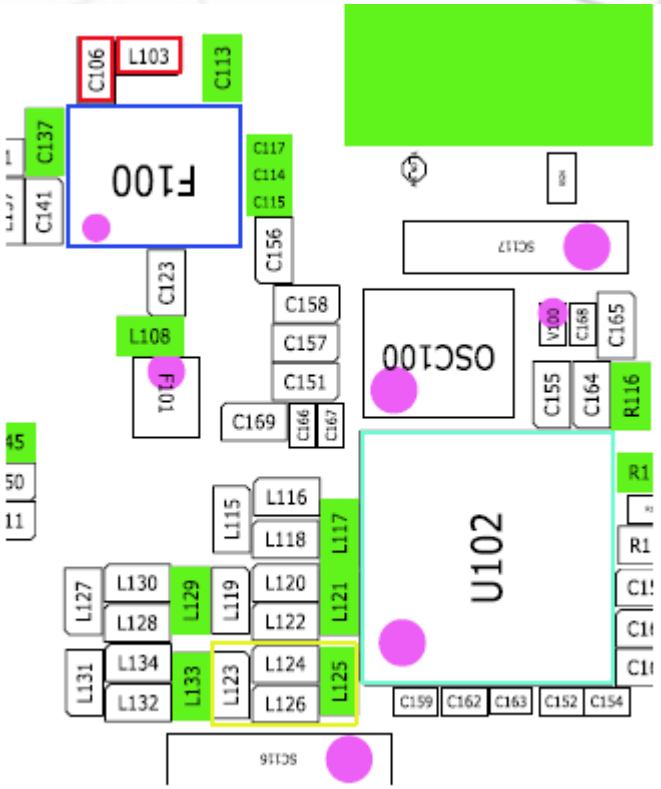


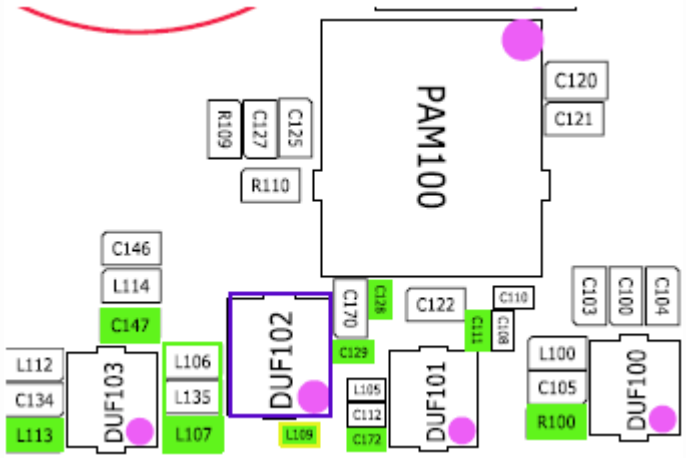


WCDMA Band2/GSM1900 RX

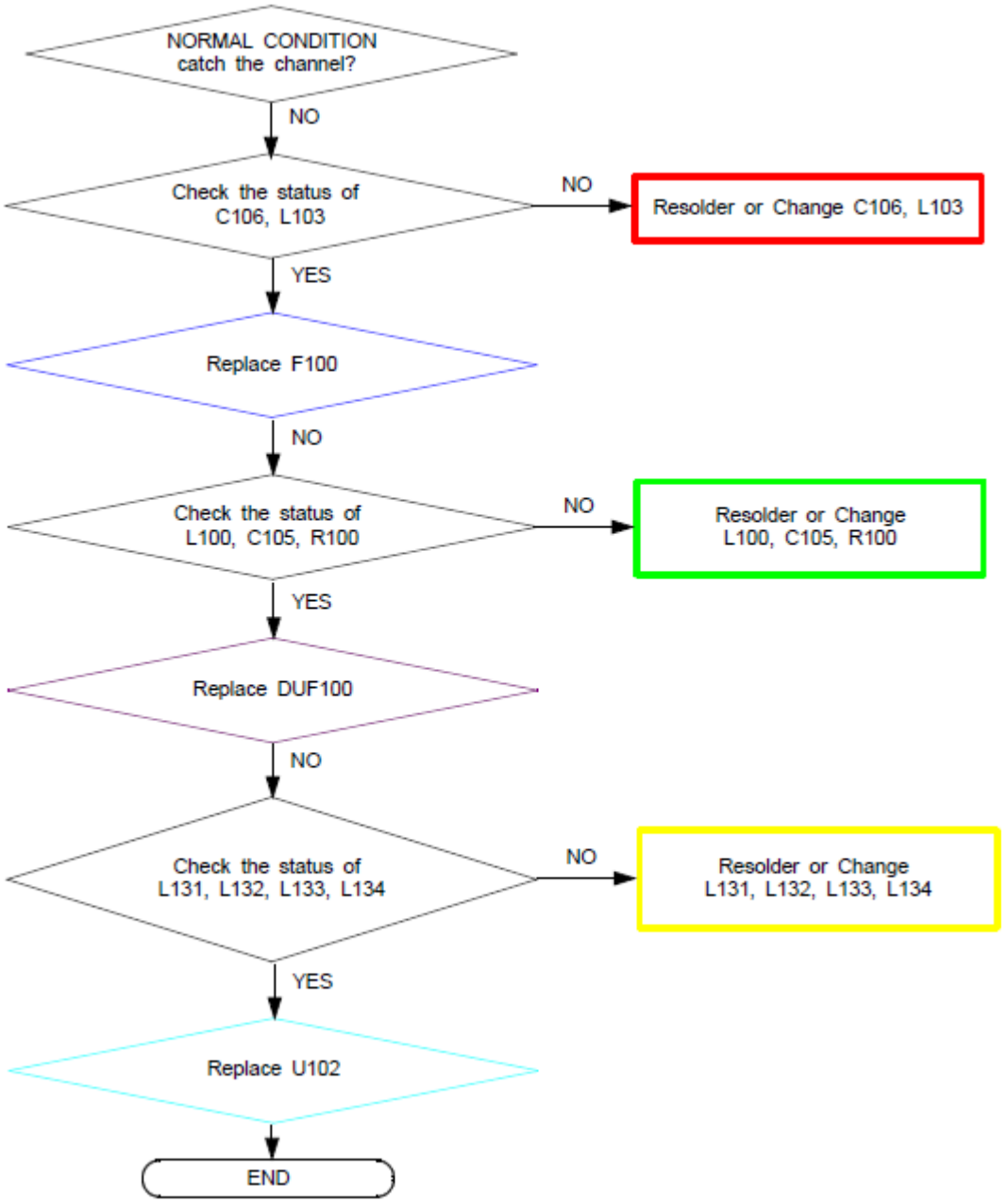


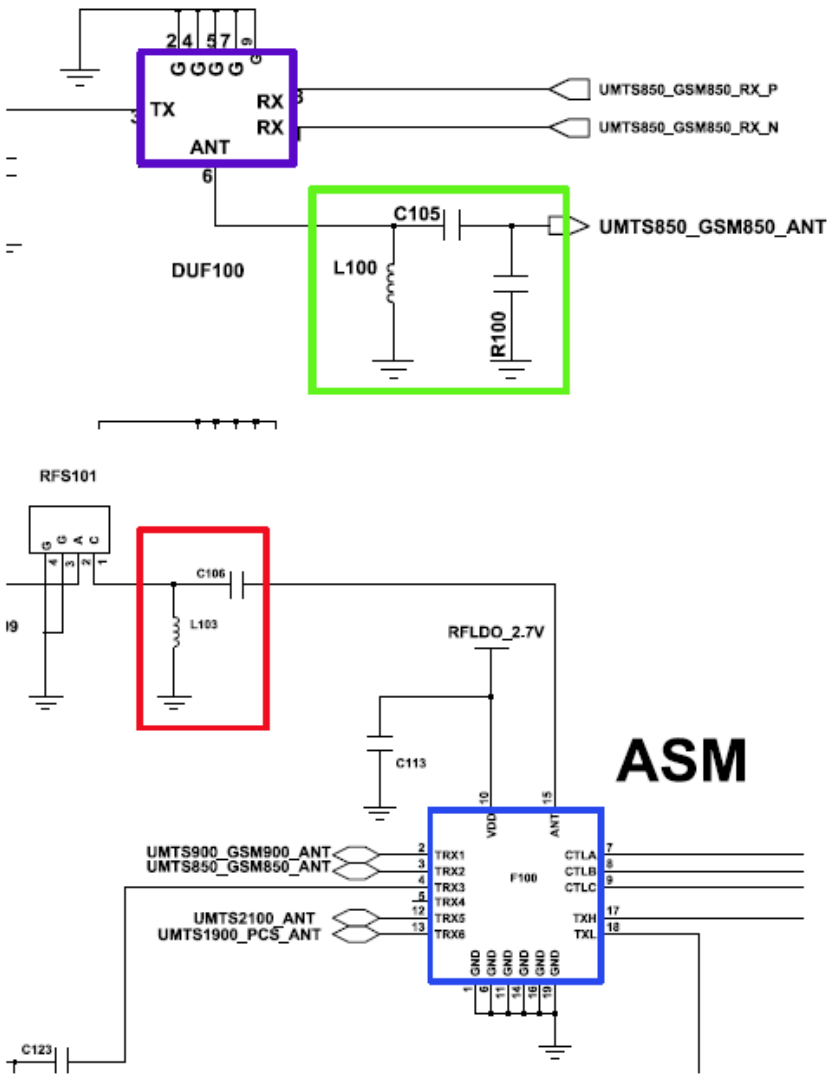
TRANSCEIVER



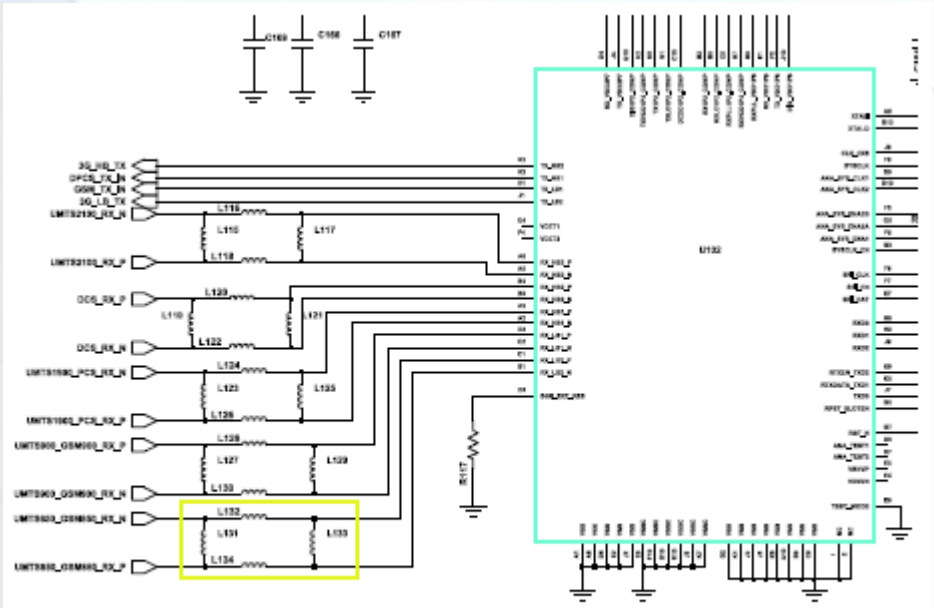


WCDMA Band5 / GSM 850 RX

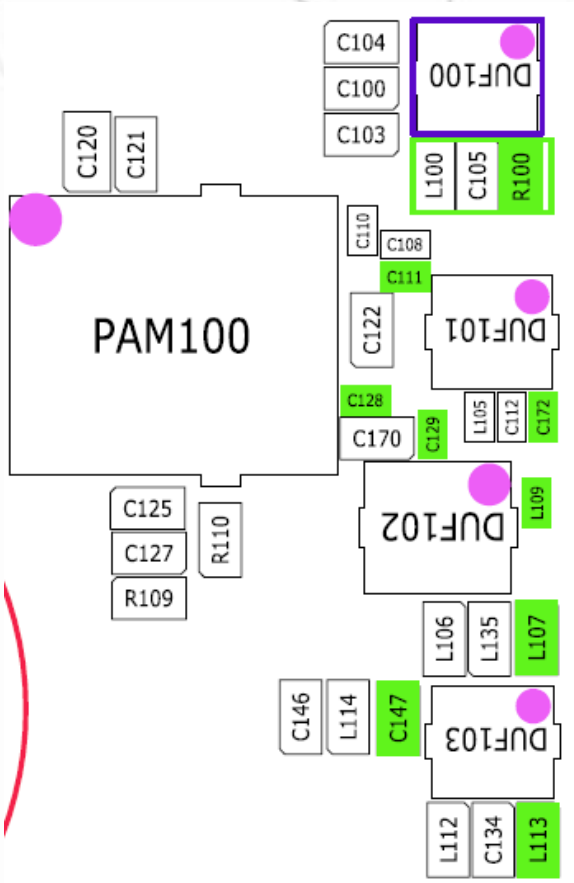


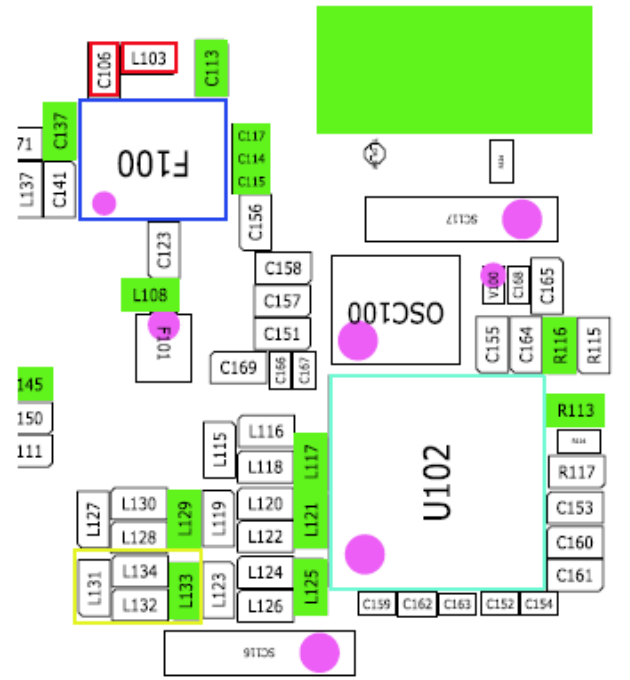


WCDMA Band5 / GSM 850 RX

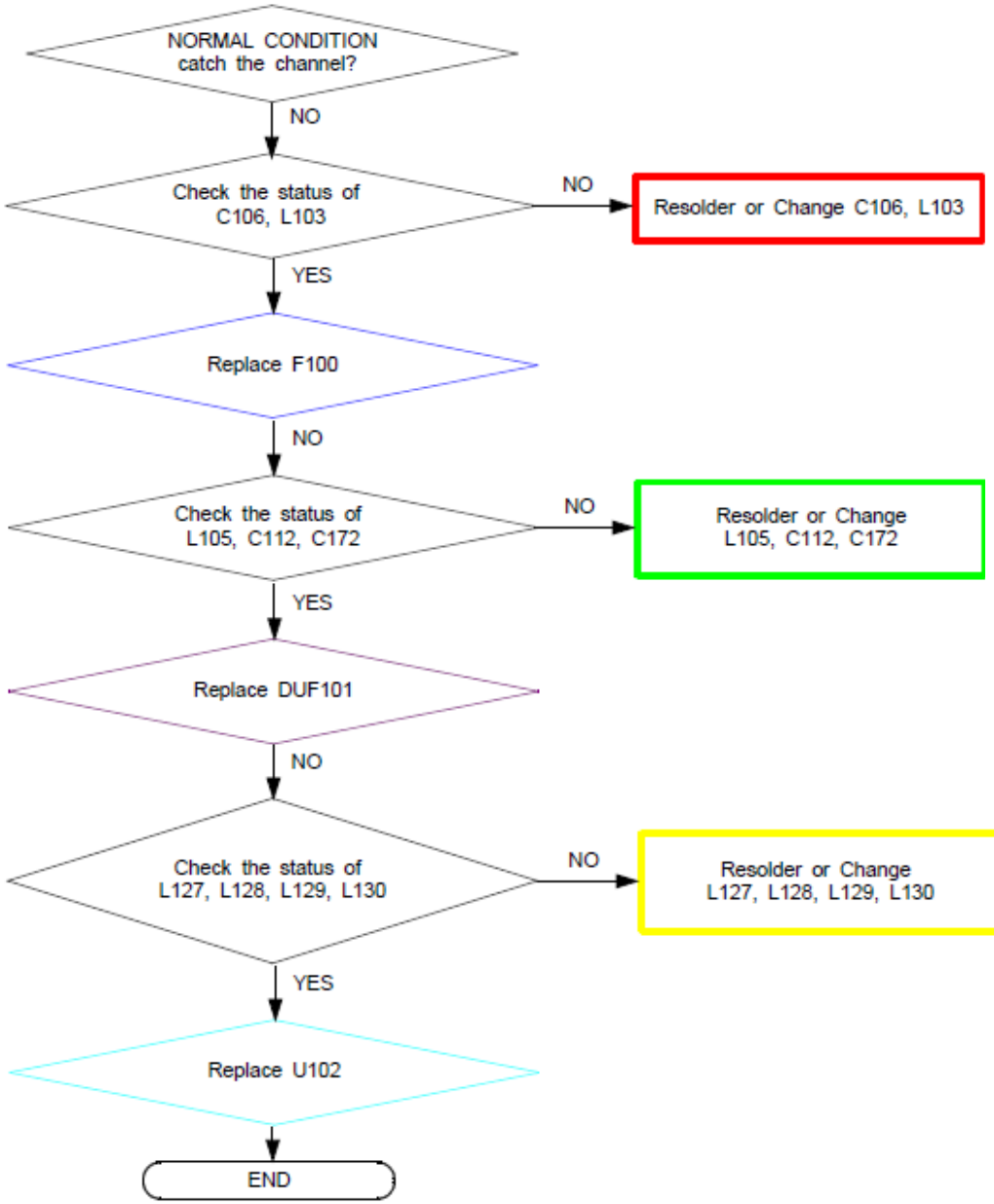


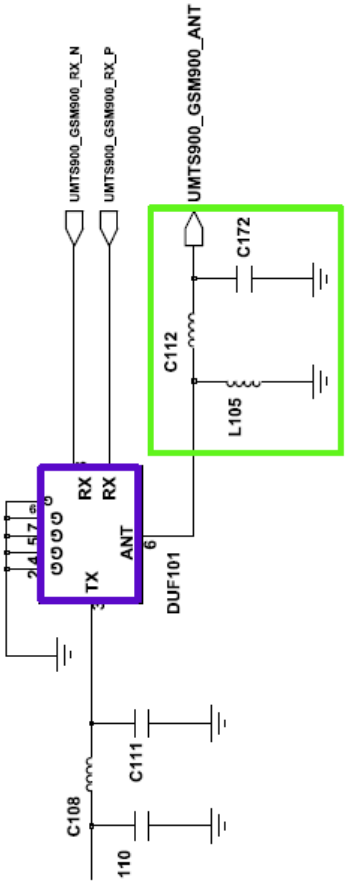
TRANSCEIVER

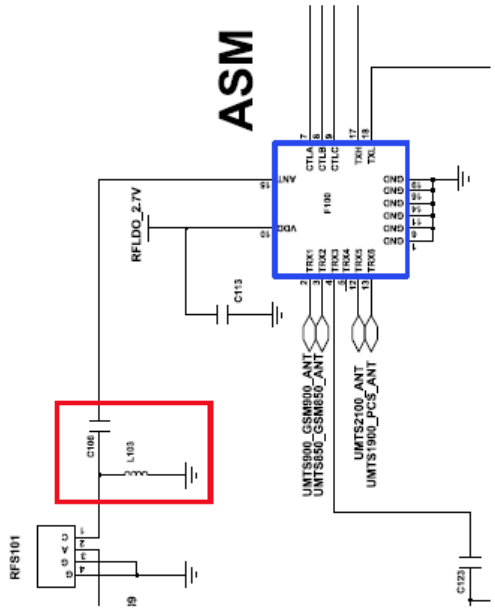




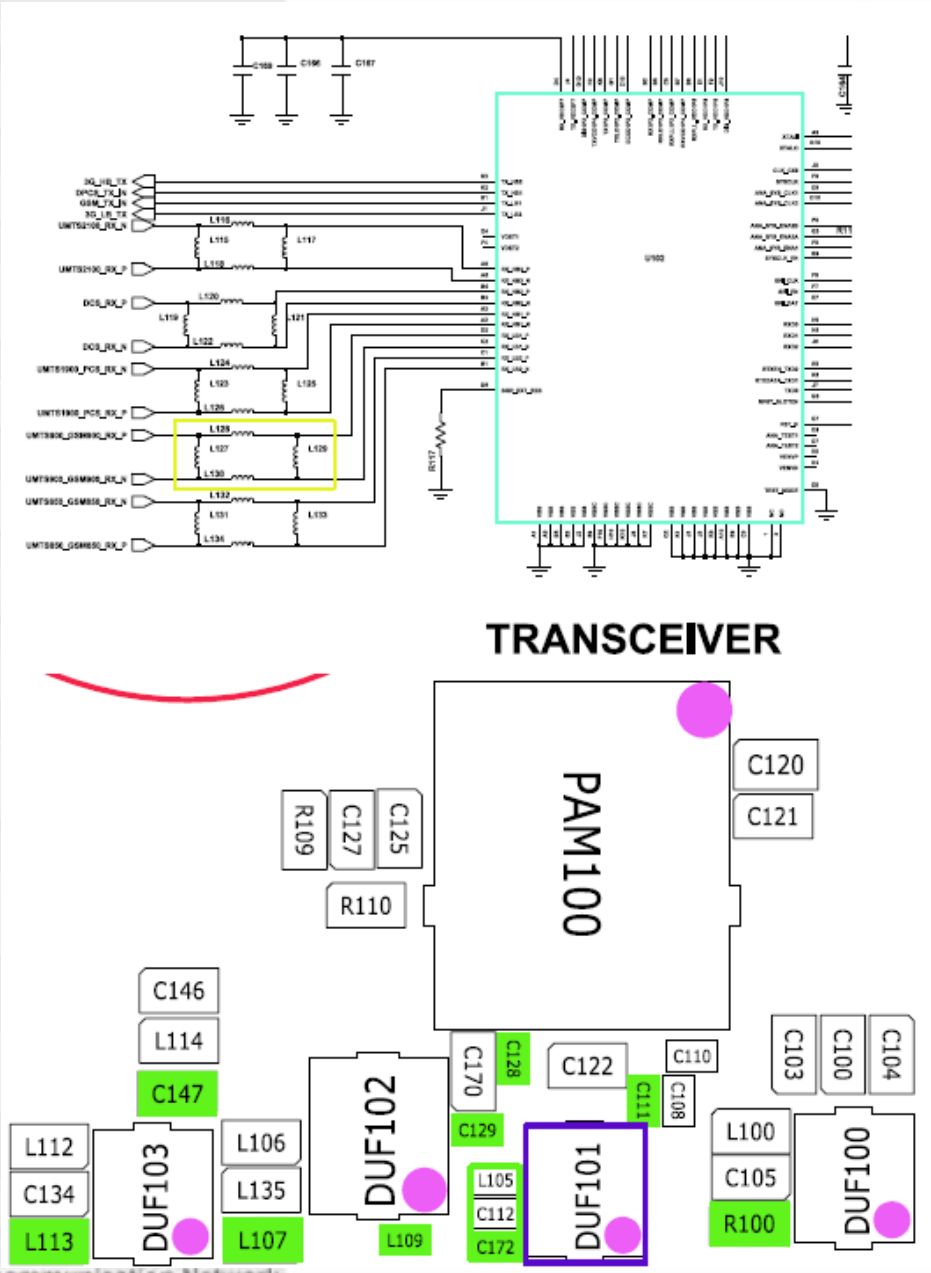
WCDMA Band8 / GSM900 RX

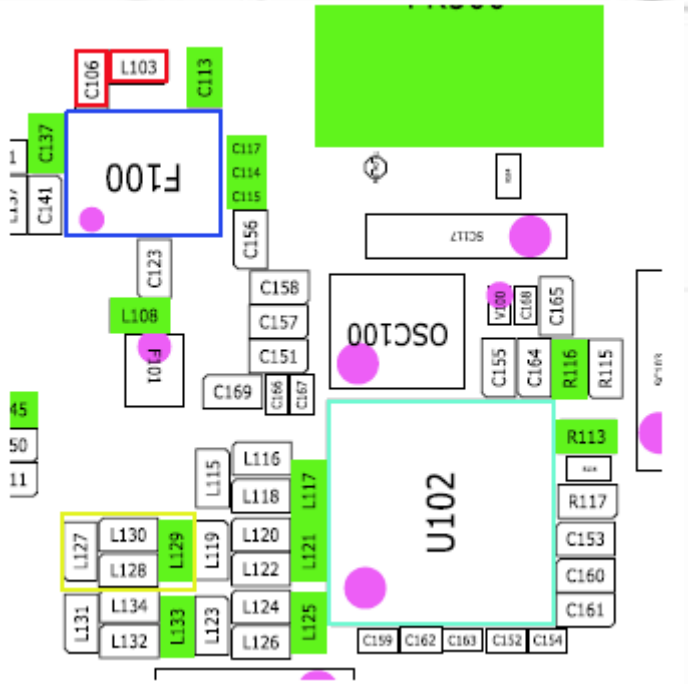




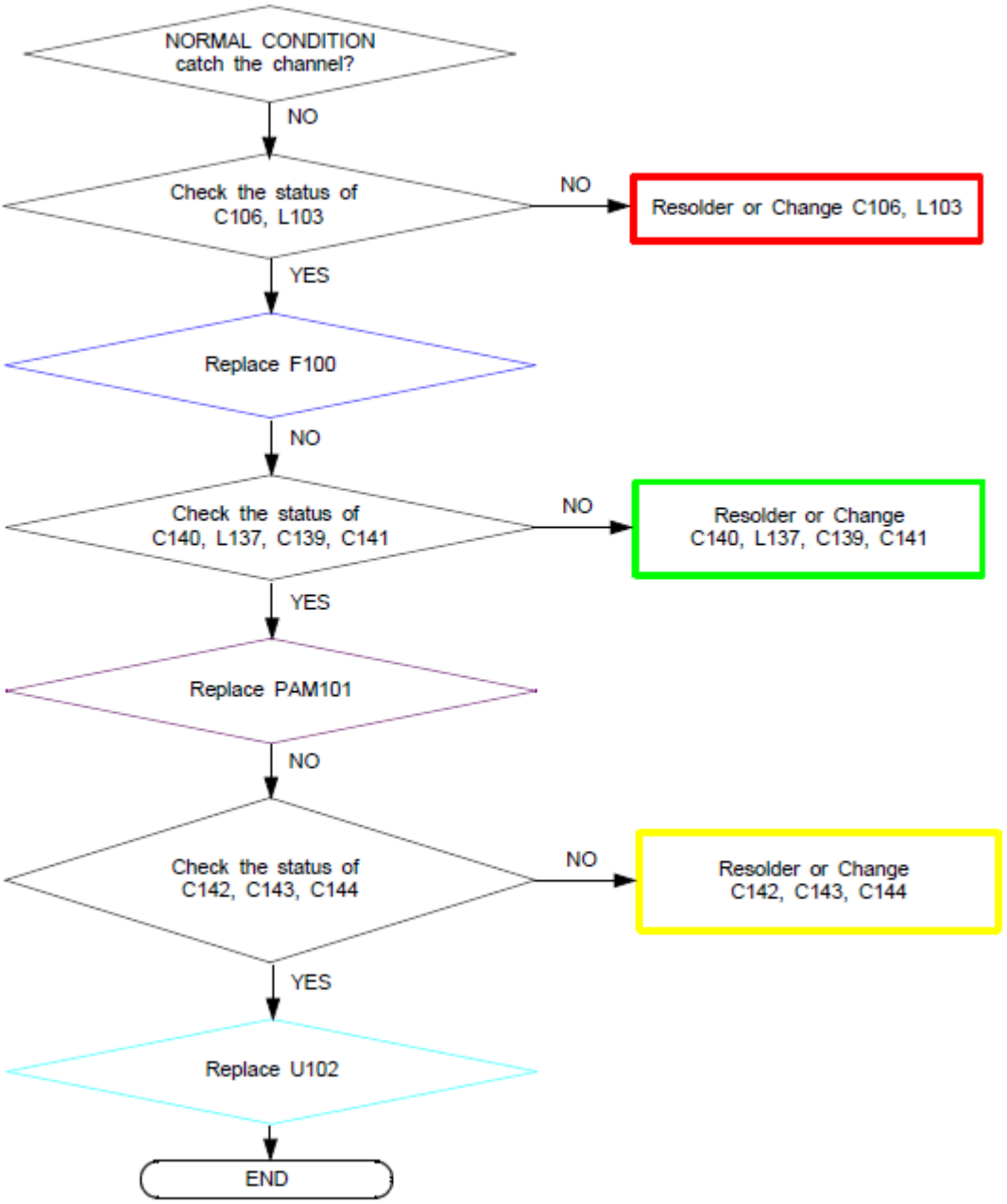


WCDMA Band8 / GSM900 RX

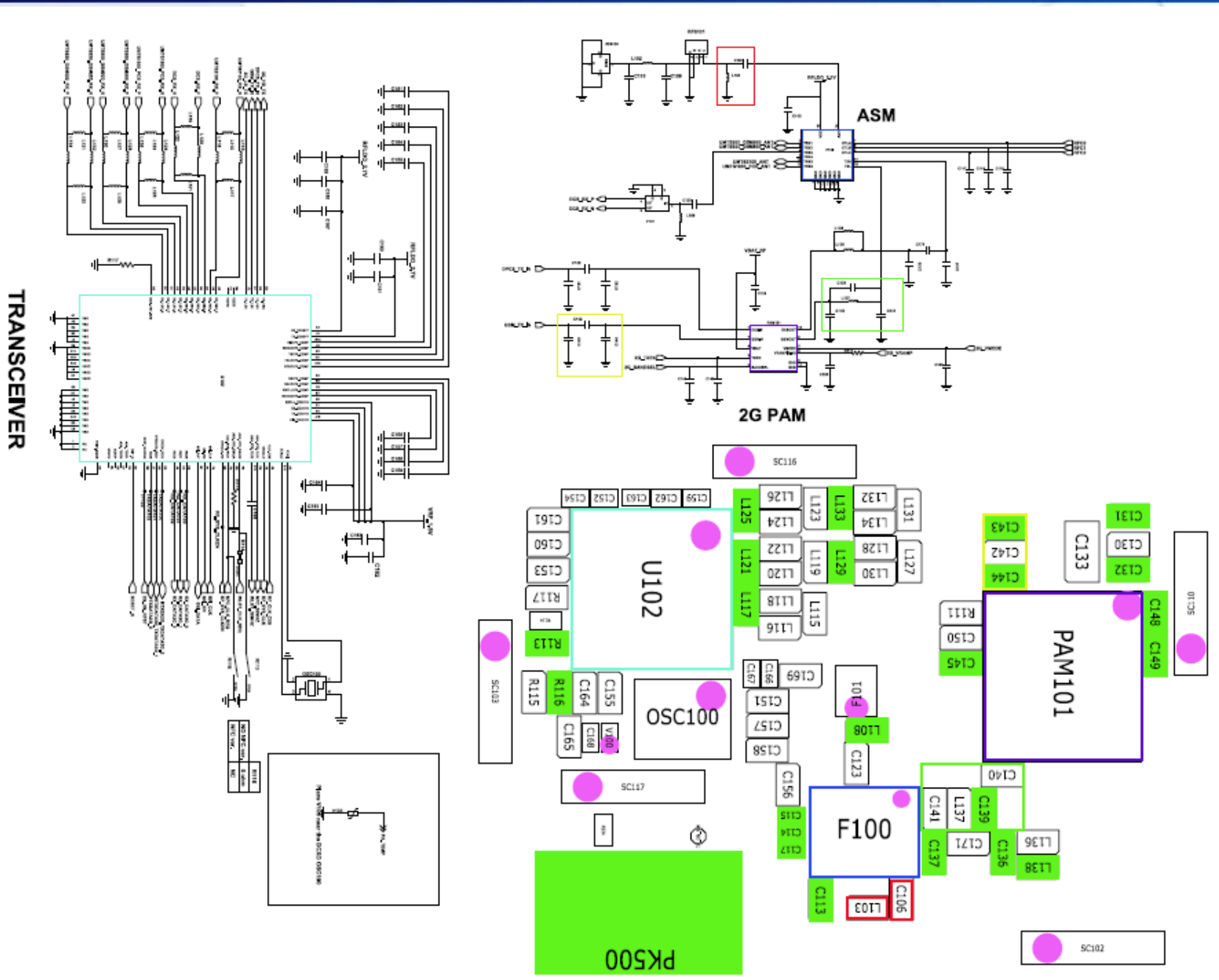




GSM 850/GSM900 TX

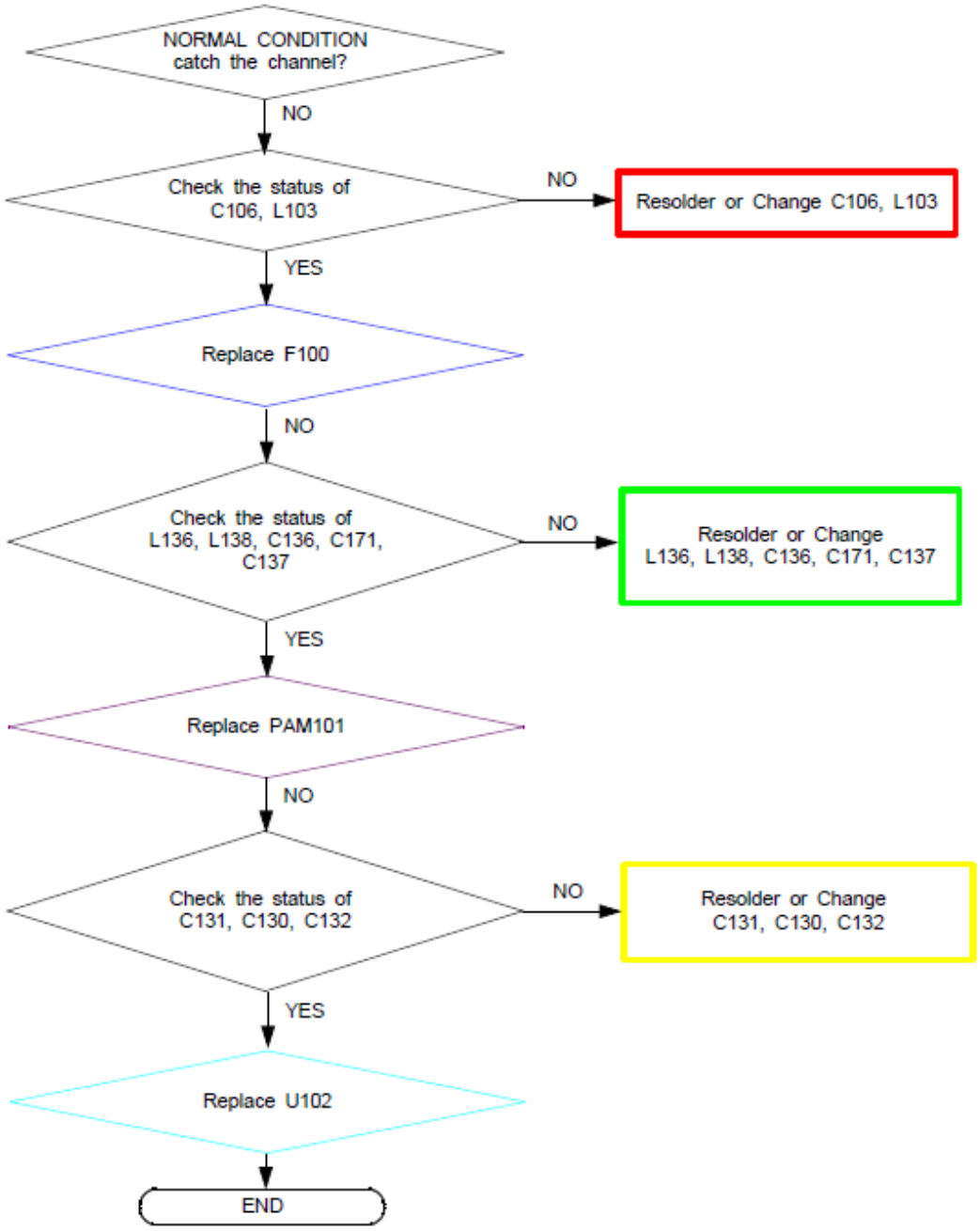


GSM 850/GSM900 TX

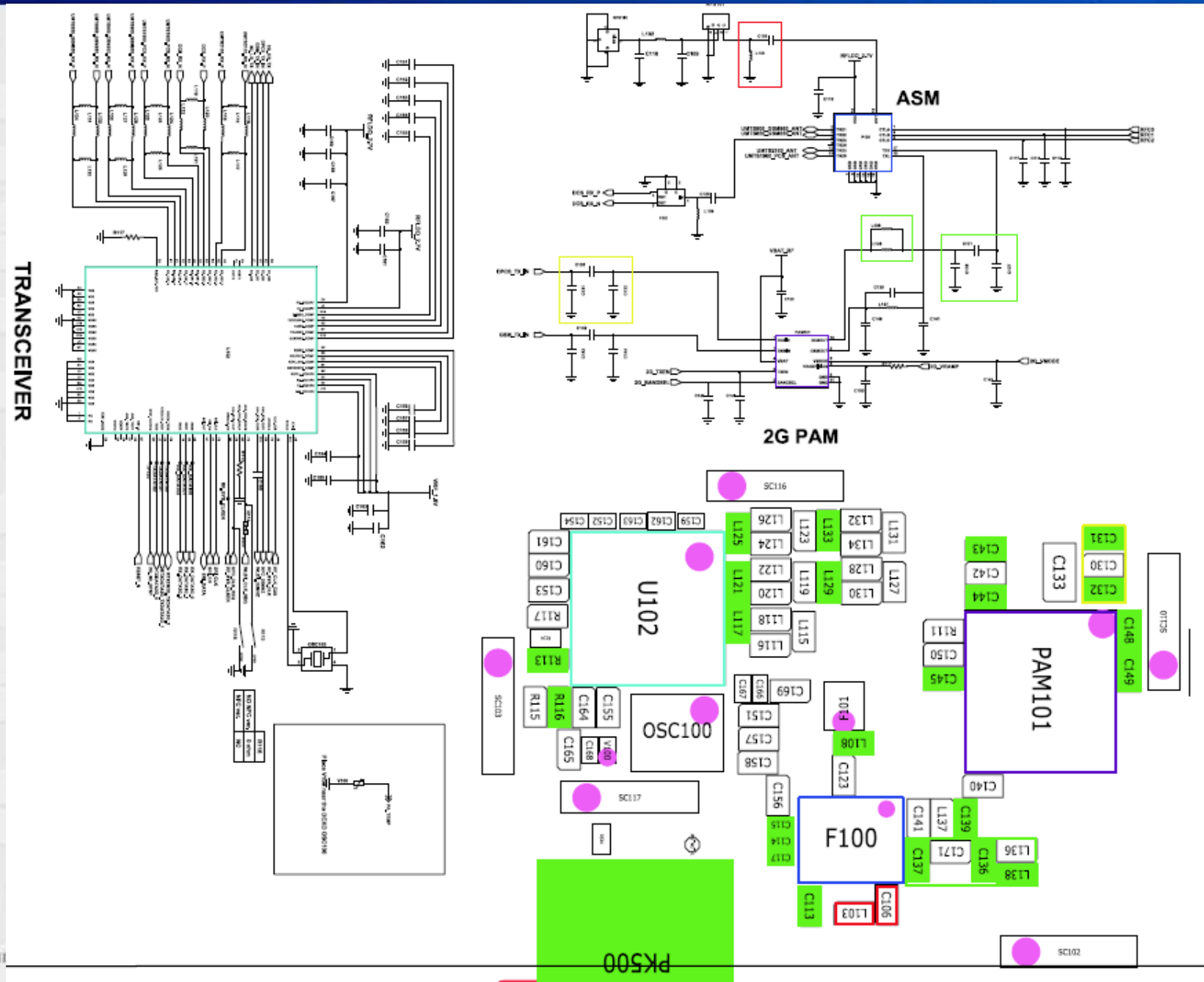


Electronics
Co., Ltd.

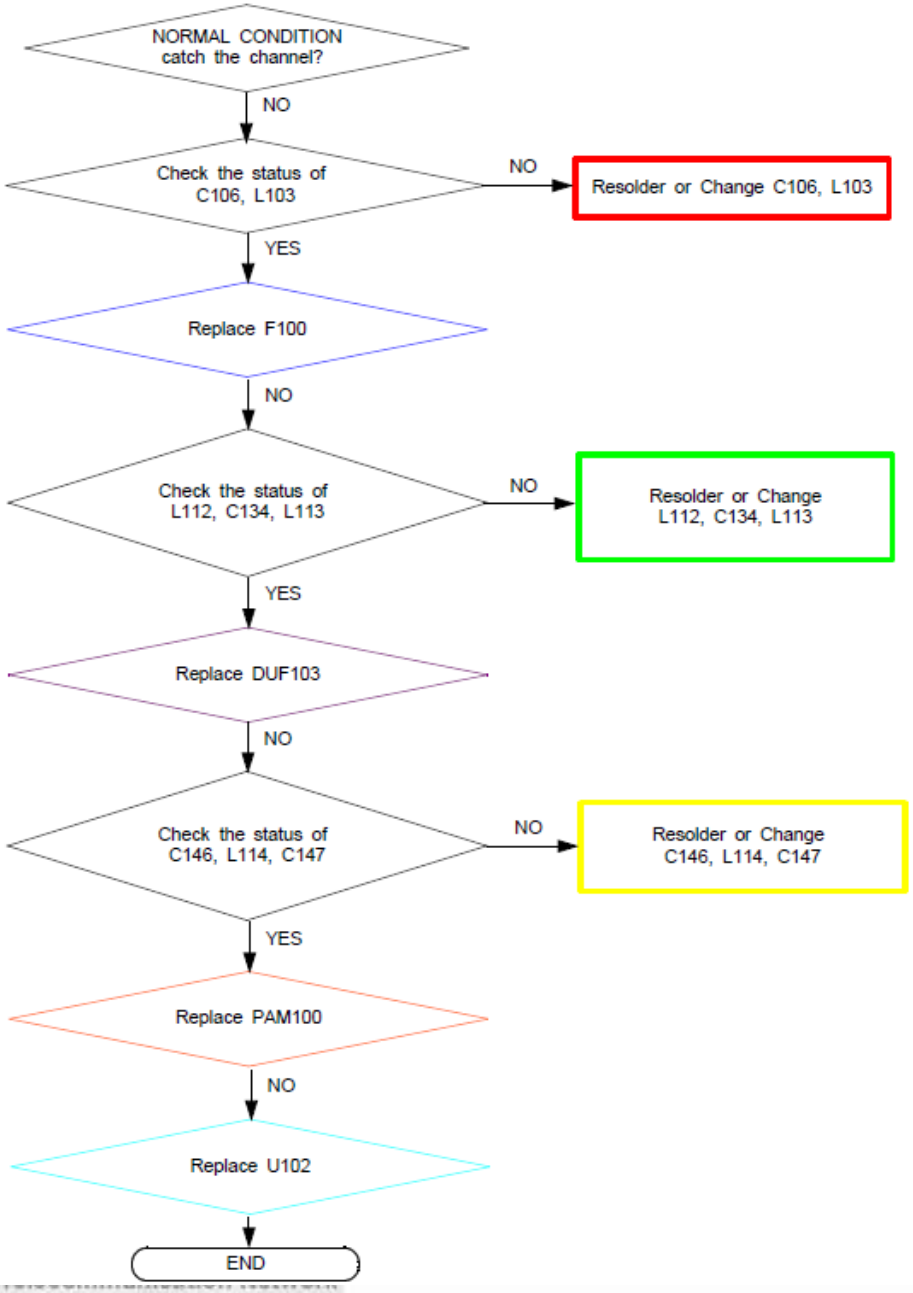
DCS/PCS TX

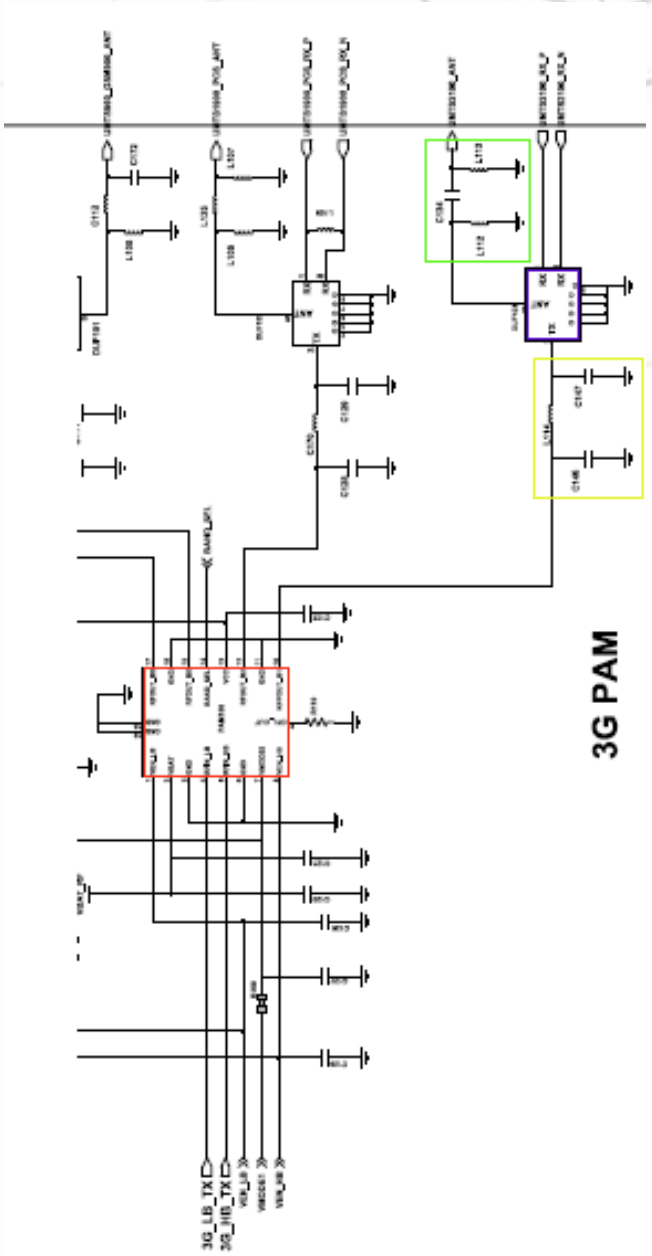

NORMAL CONDITION
catch the channel?
NO
Check the status of
C106, L103
NO
Resolder or Change C106, L103
YES
Replace F100
NO
Check the status of
L136, L138, C136, C171,
C137
NO
Resolder or Change
L136, L138, C136, C171, C137
YES
Replace PAM101
NO
Check the status of
C131, C130, C132
NO
Resolder or Change
C131, C130, C132
YES
Replace U102
END

DCS/PCS TX

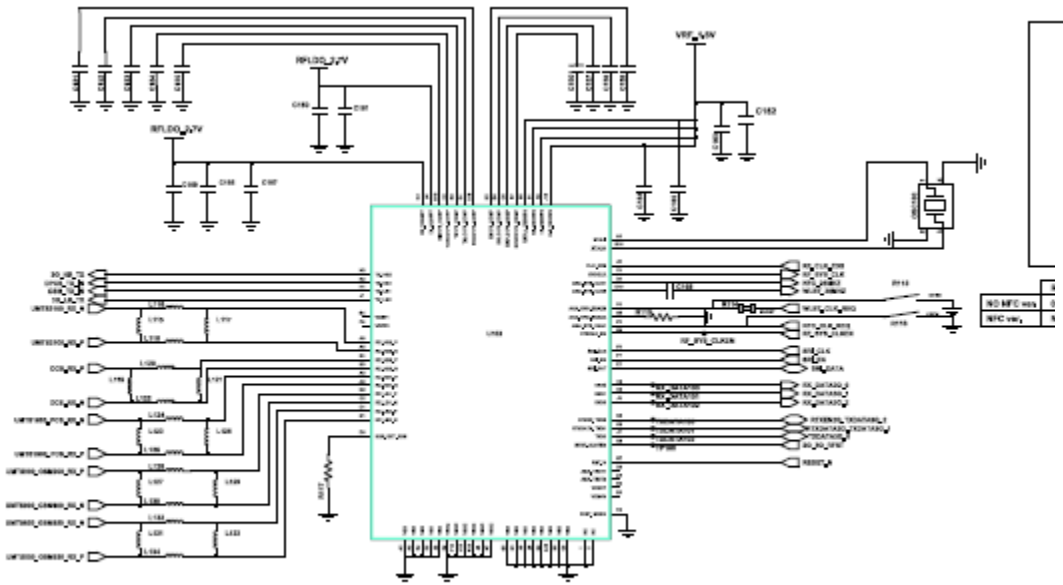


WCDMA Band1 TX

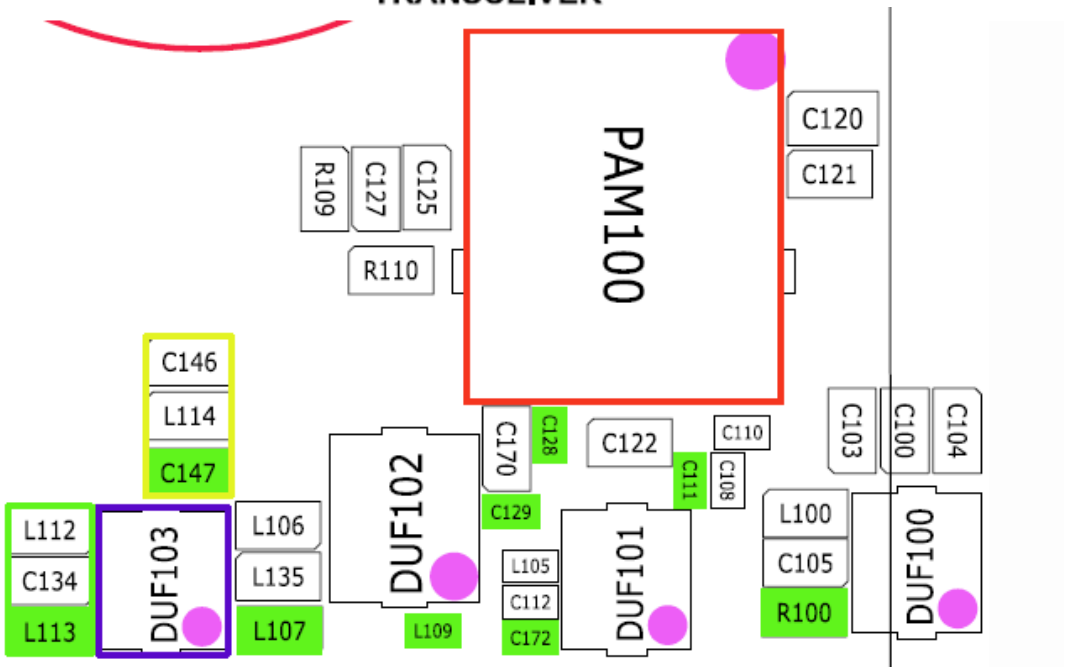


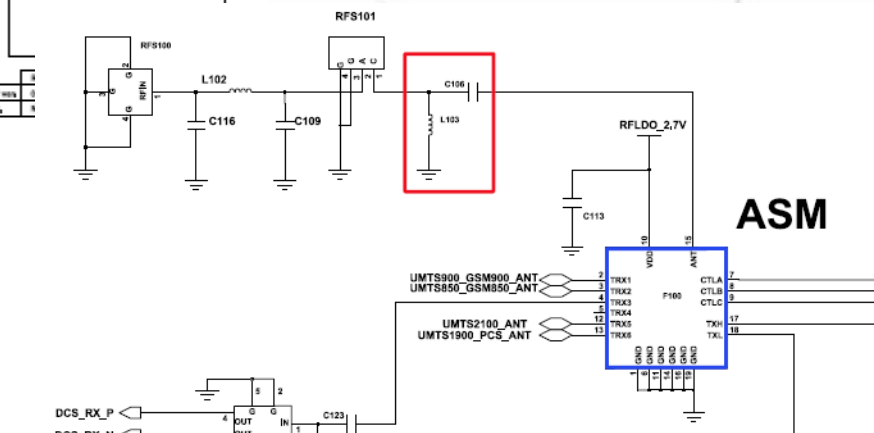


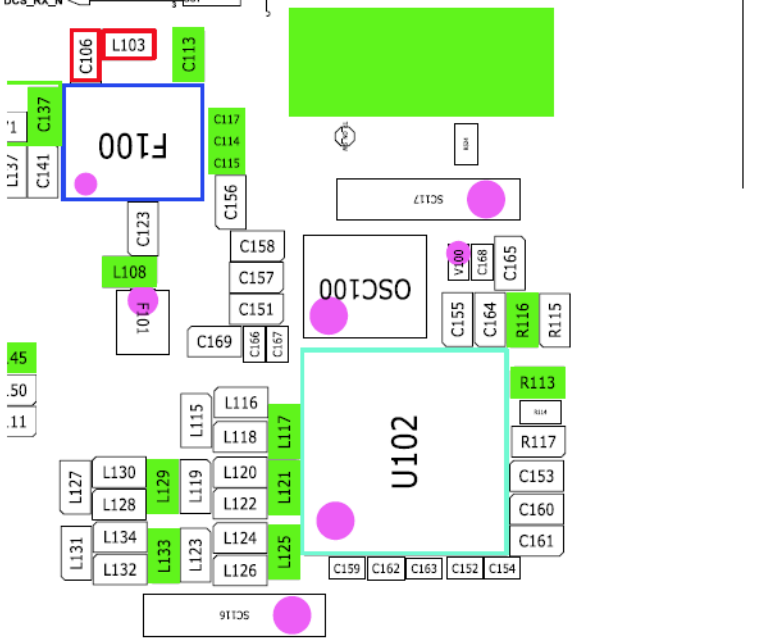
WCDMA Band1 TX



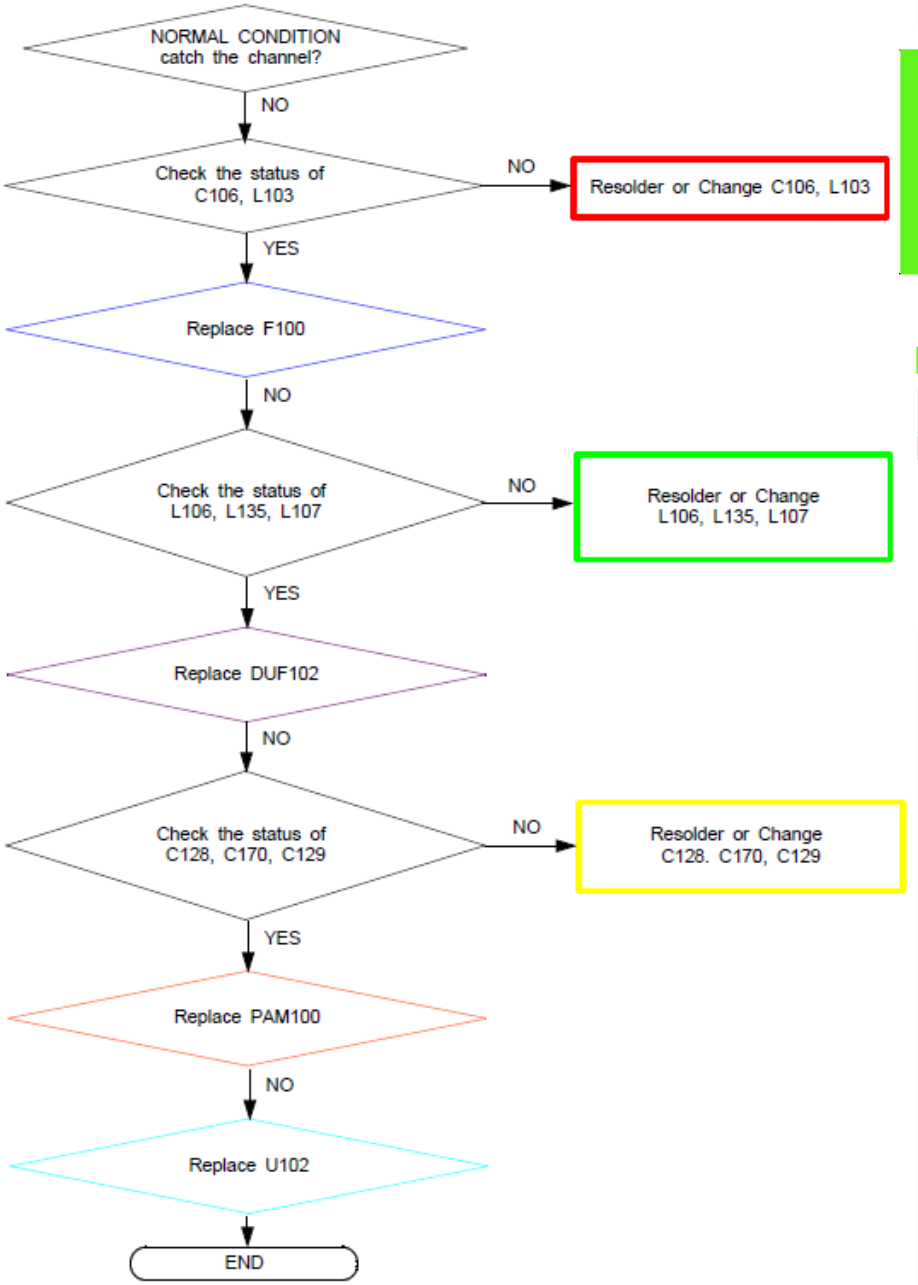
TRANSCEIVER

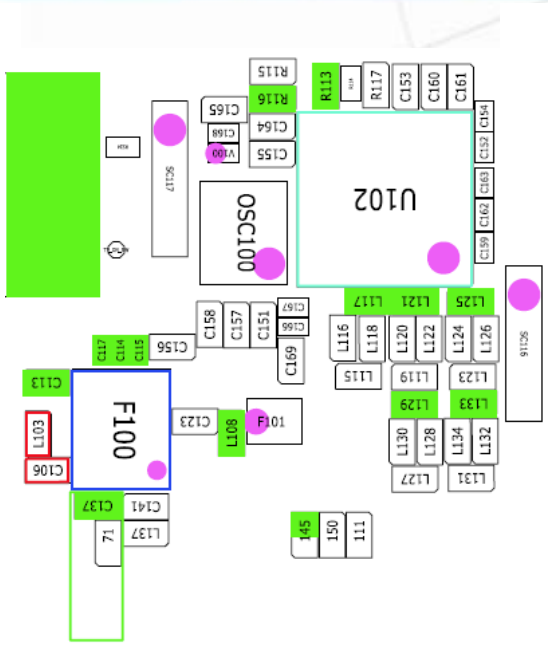


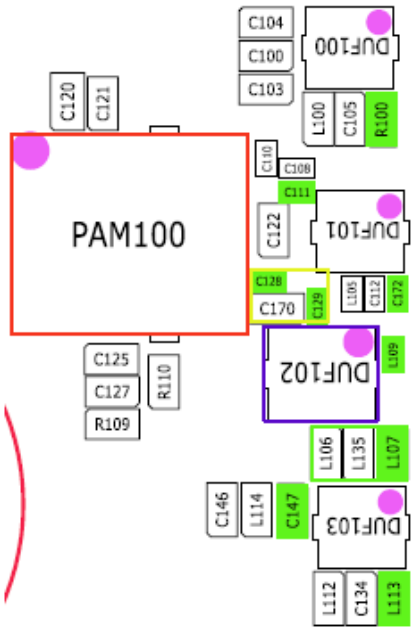


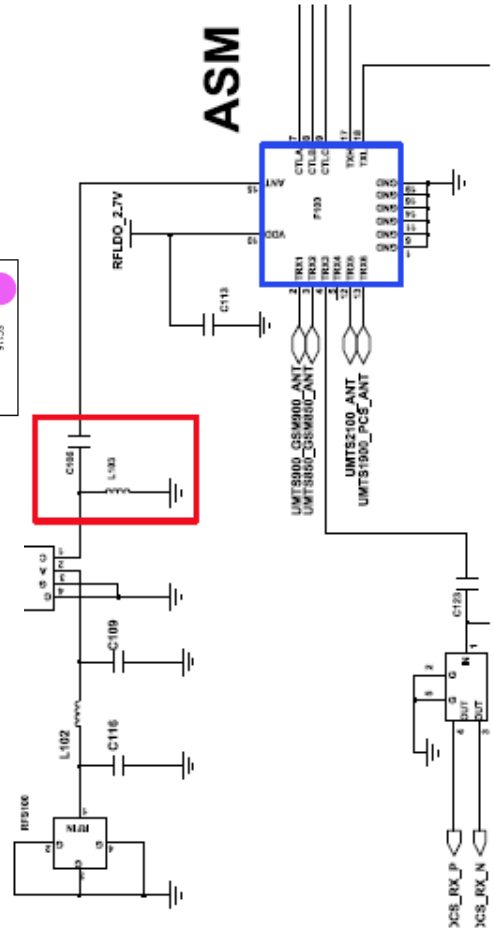


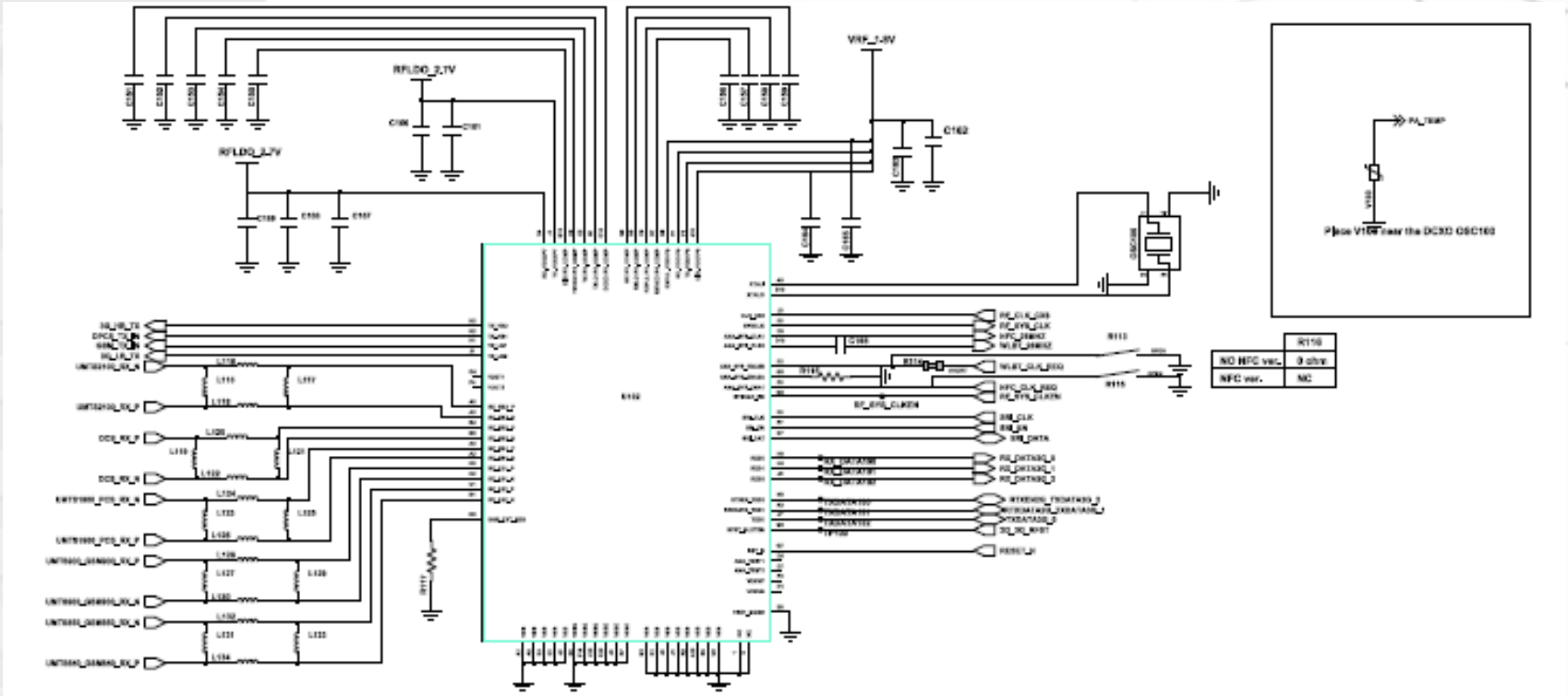
WCDMA Band2 TX



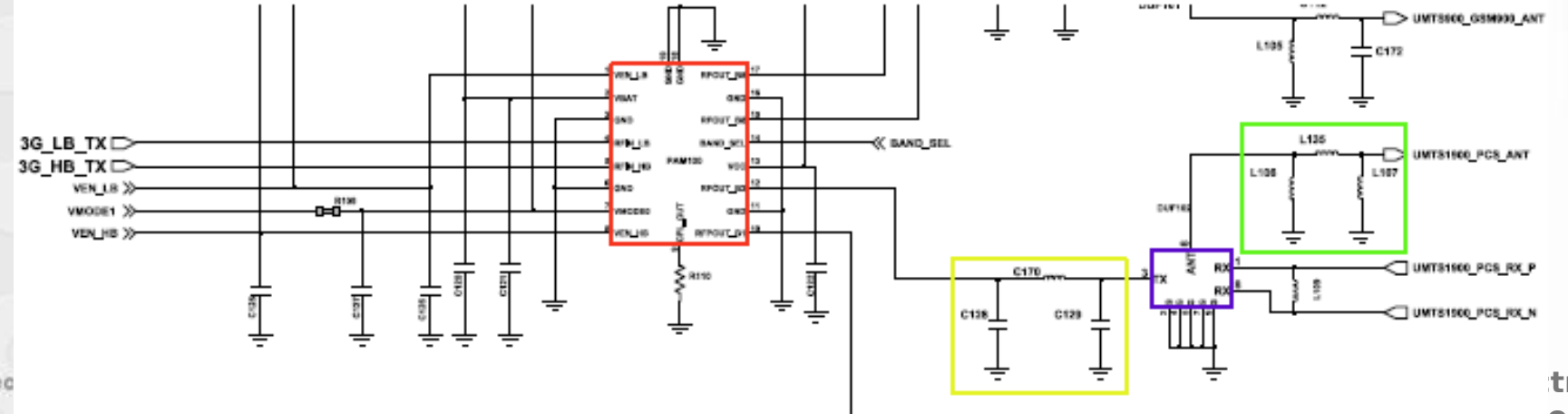




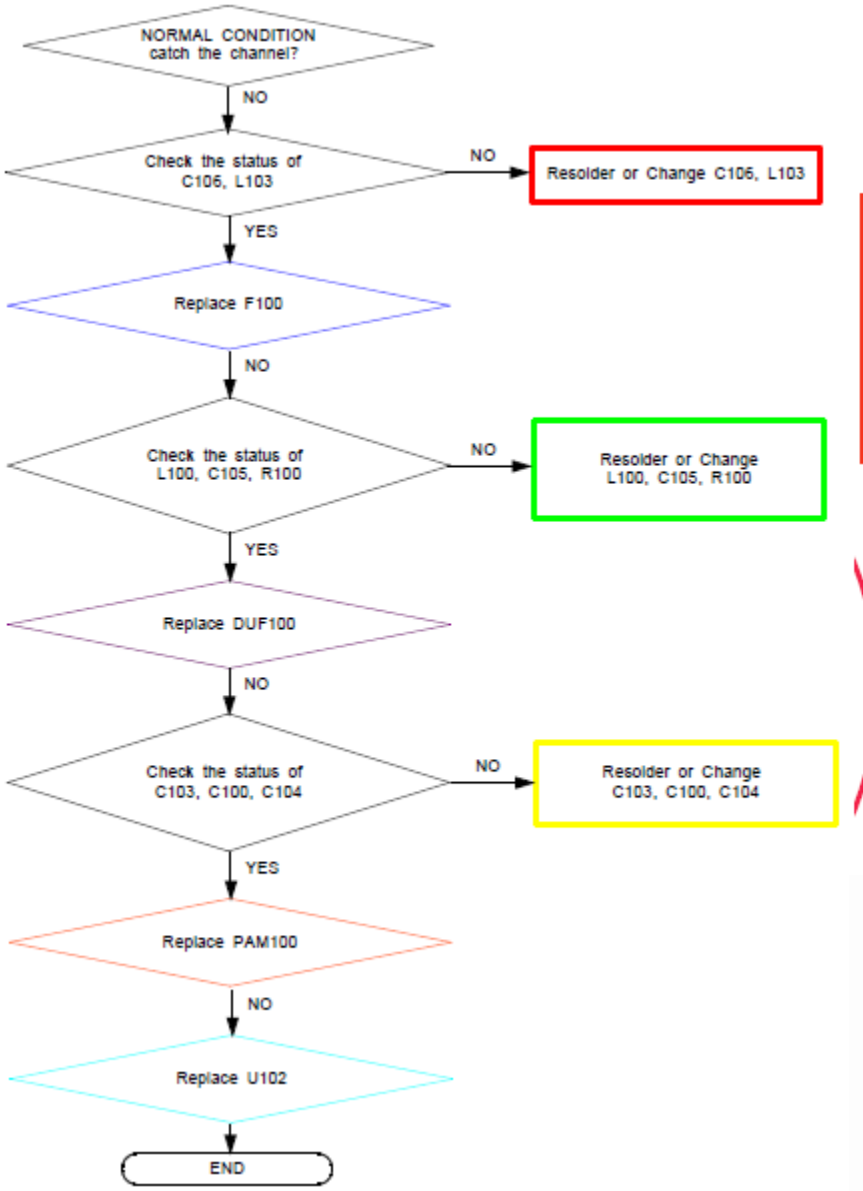


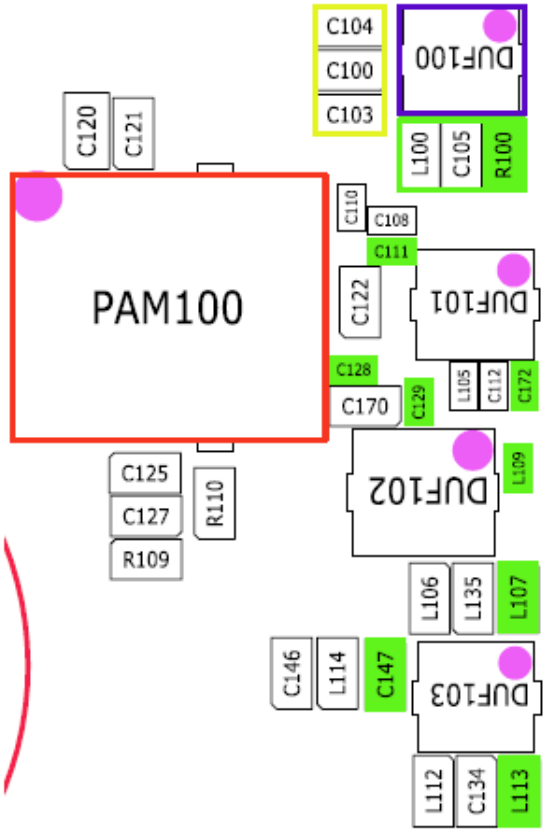


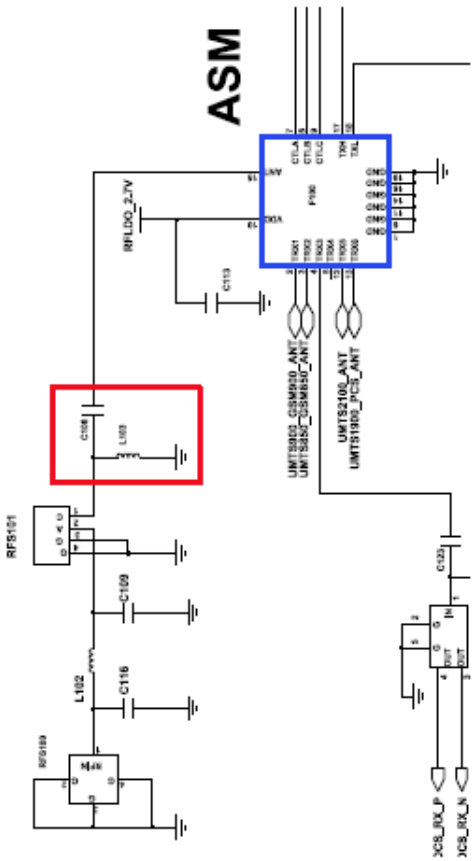
TRANSCEIVER



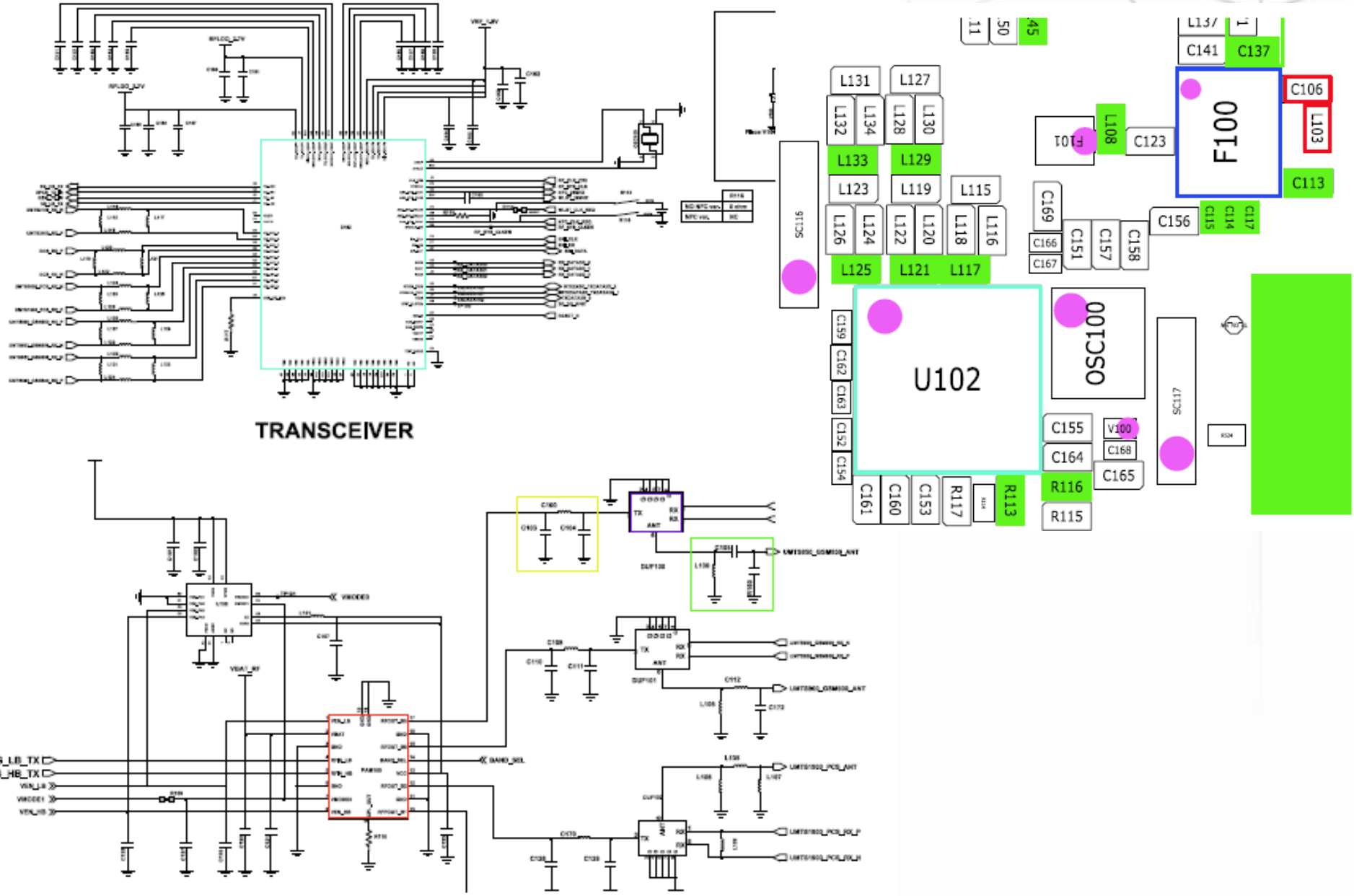
WCDMA Band5 Tx



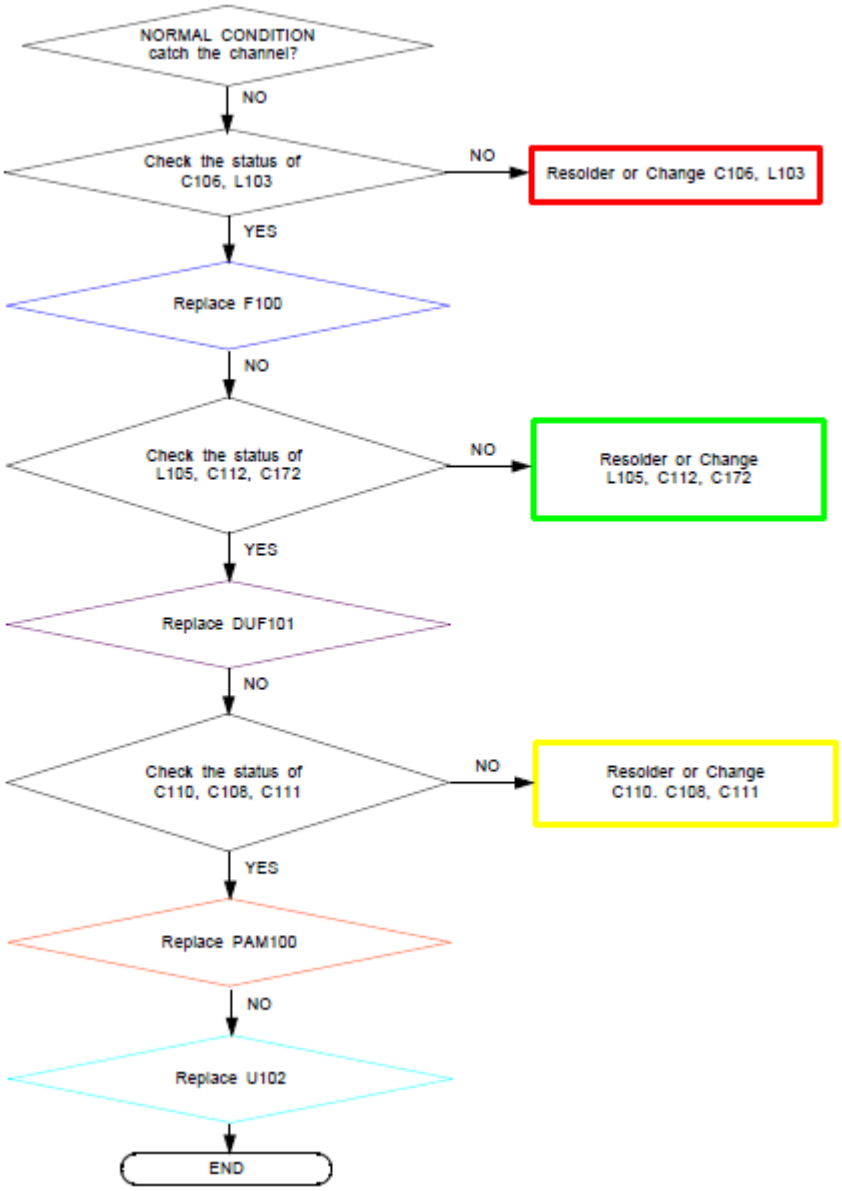


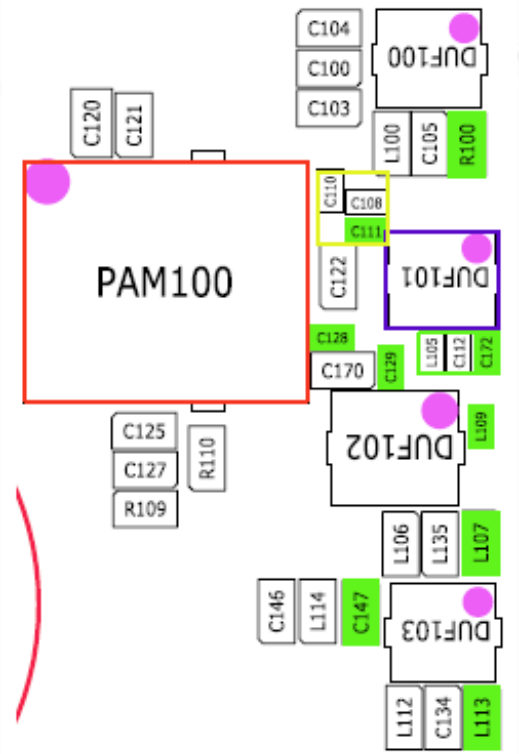


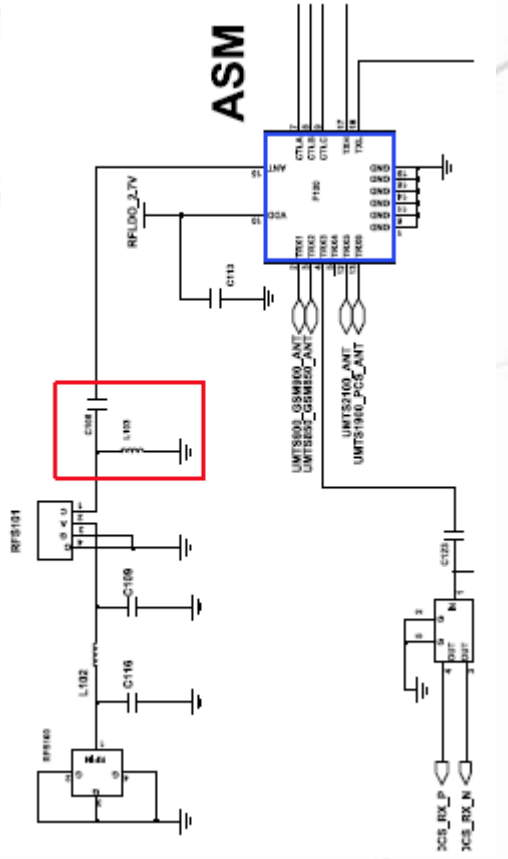
WCDMA Band5 TX

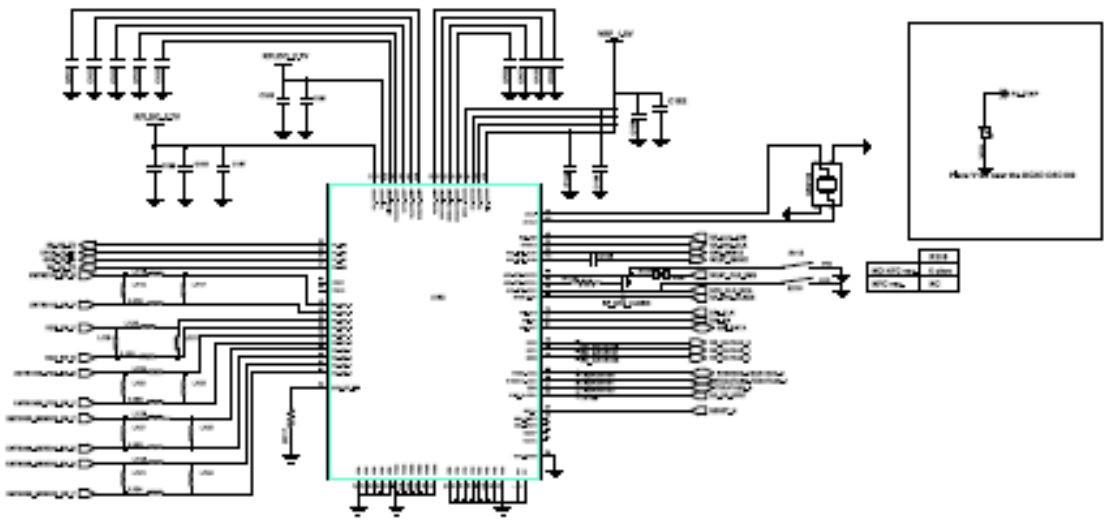


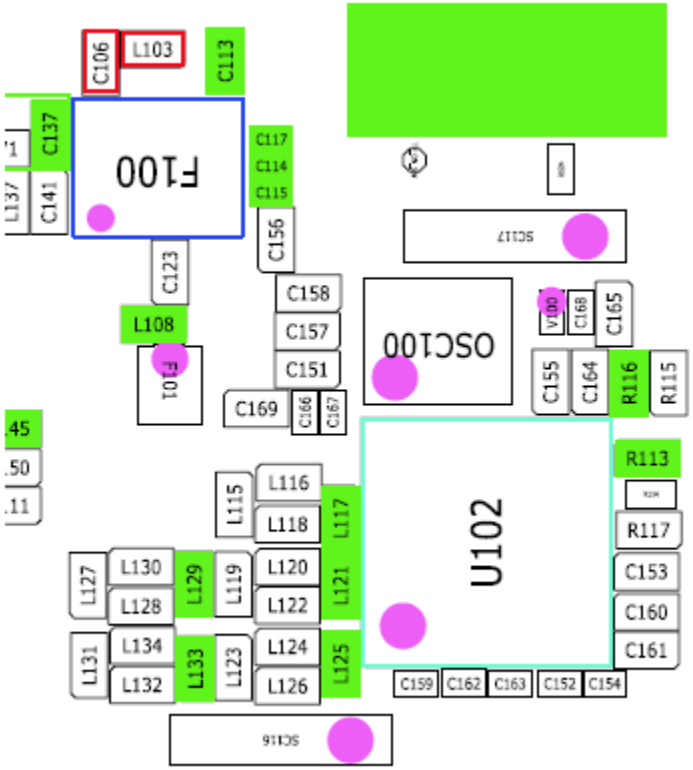
WCDMA Band8 TX



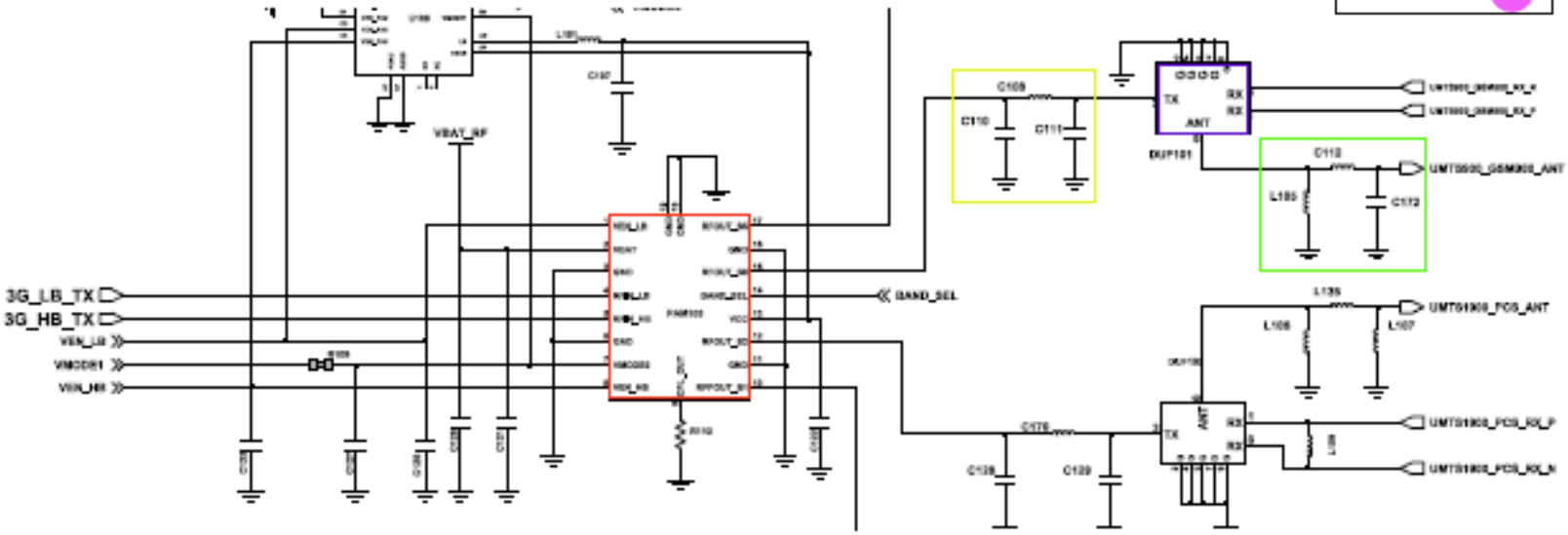




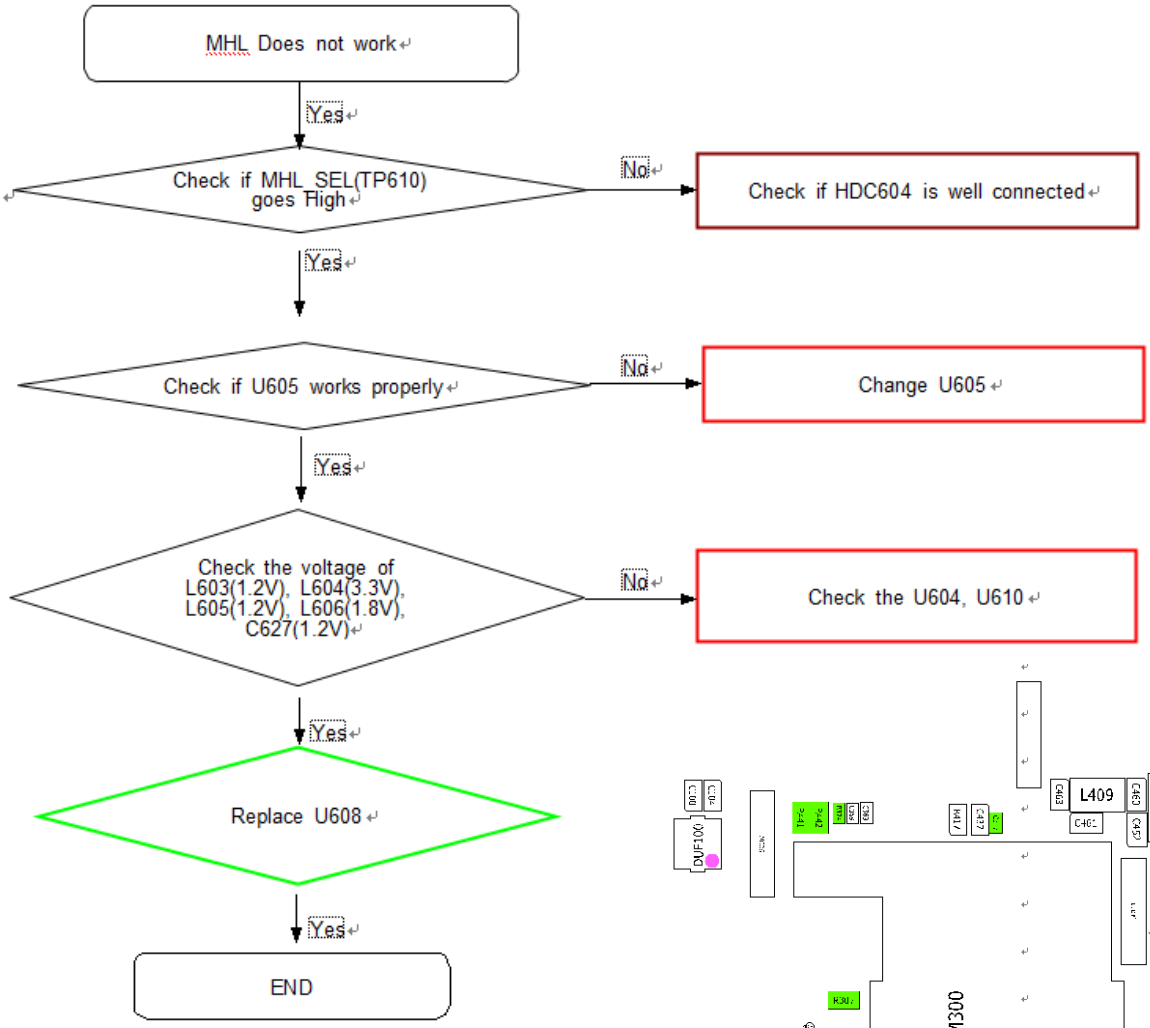


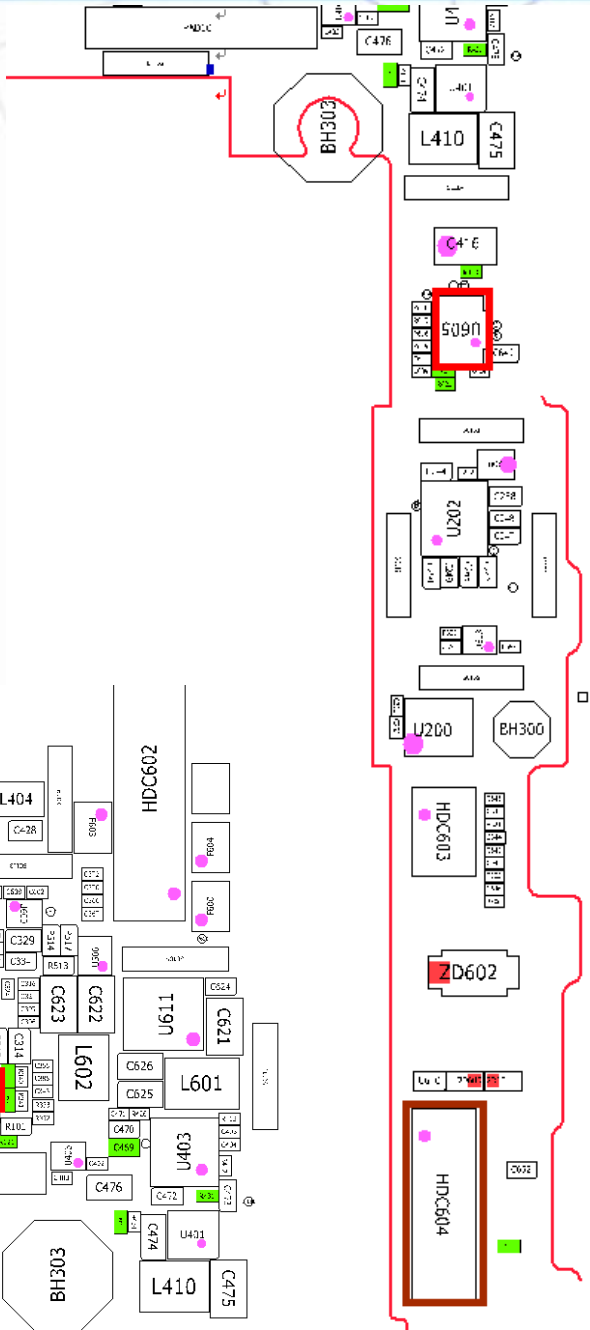


TRANSCEIVER

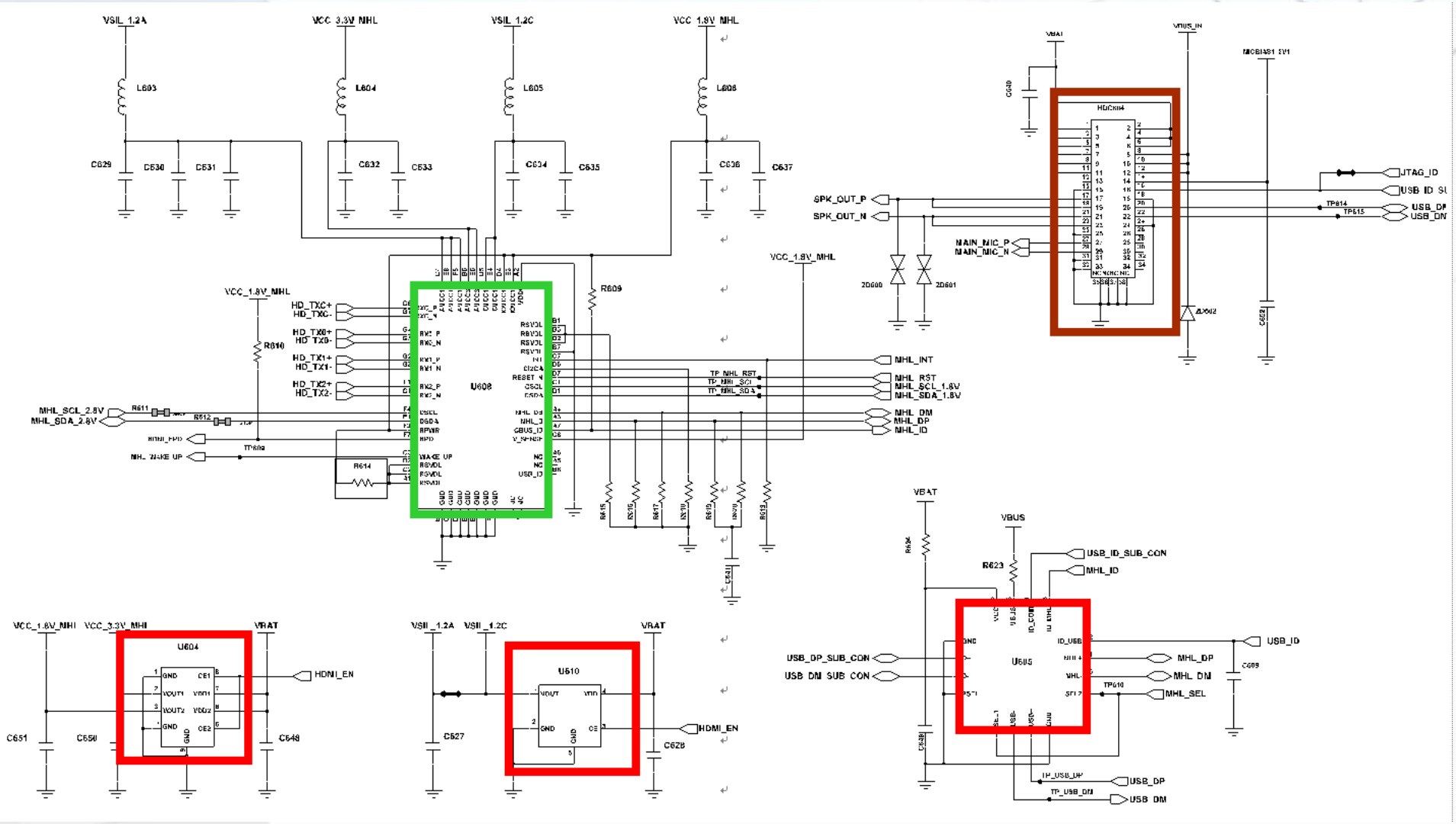


MHL

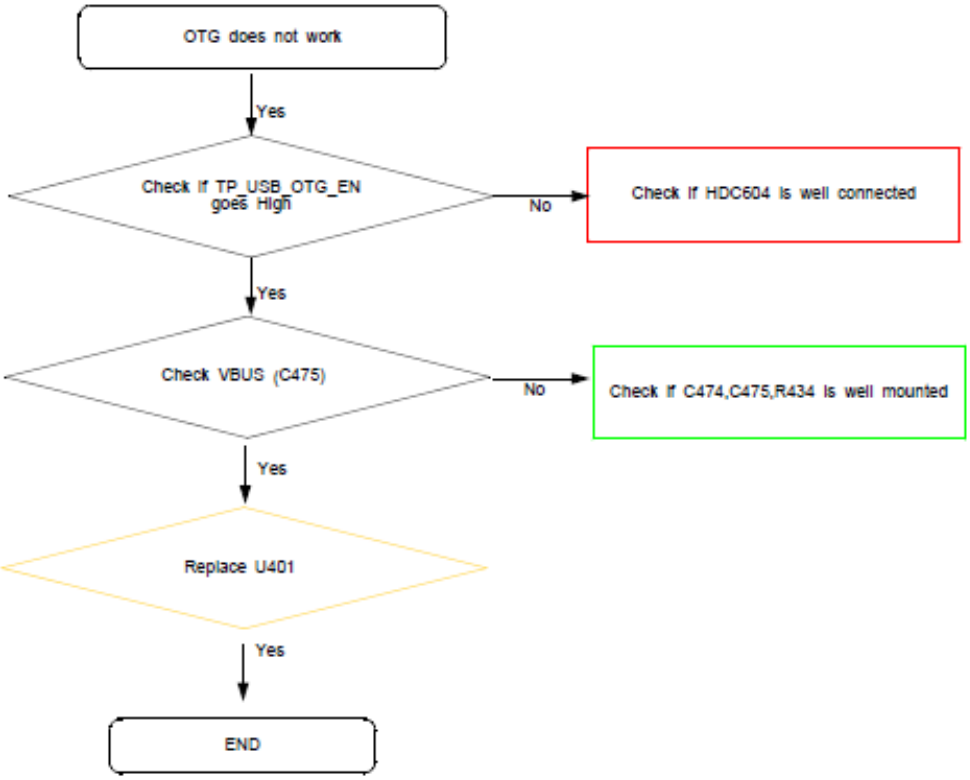


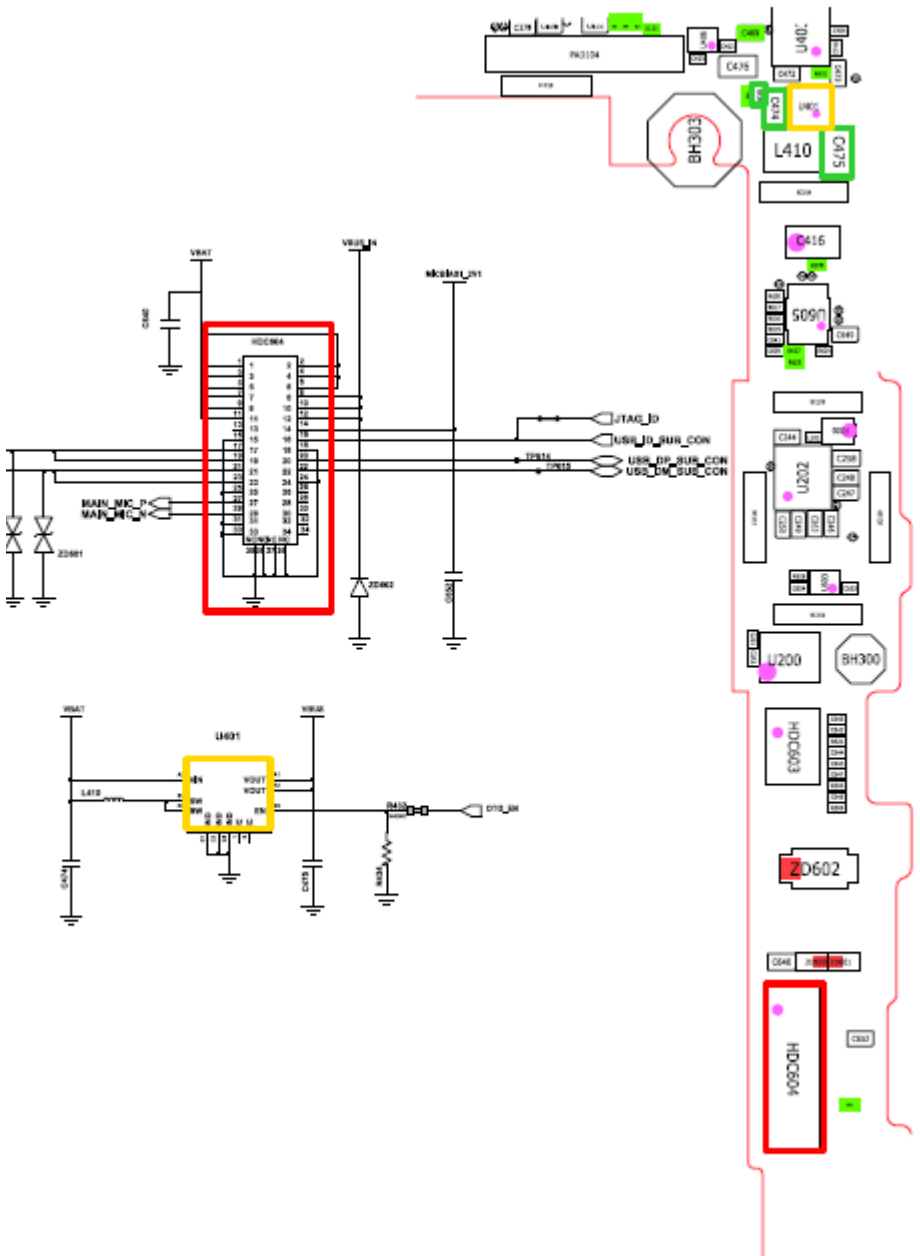


Telecommunication Network


VSIL_1.2A
VCC_3.3V_MHL
VSIL_1.2C
VCC_1.8V_MHL
L603
L604
L605
L606
C629
C630
C631
C632
C633
C634
C635
C636
C637
VCC_1.8V_MHL
HD_TXC+
HD_TXC-
HD_TX0+
HD_TX0-
HD_TX1+
HD_TX1-
HD_TX2+
HD_TX2-
R610
U608
R609
MHL_SCL_2.8V
MHL_SDA_2.8V
R611
R612
HDMI_HPD
MHL_WAKE_UP
TP609
R614
R615
R616
R617
R618
R619
R620
R621
TP_MHL_RST
TP_MHL_SCL
TP_MHL_SDA
MHL_INT
MHL_RST
MHL_SCL_1.8V
MHL_SDA_1.8V
MHL_DM
MHL_DP
MHL_ID
SPK_OUT_P
SPK_OUT_N
MAIN_MIC_P
MAIN_MIC_N
2D600
2D601
HDCN14
VBAT
VBUS_IN
C640
MOBIA81 SW1
2D602
C628
JTAG_ID
USB_ID_SI
TP614
TP615
USB_DP
USB_DN
VCC_1.8V_MHL
VCC_3.3V_MHL
VBAT
U604
HDMI_EN
C651
C650
C648
VSIL_1.2A
VSIL_1.2C
VBAT
U610
C627
HDMI_EN
C626
VBAT
VBUS
R624
R623
USB_ID_SUB_CON
MHL_ID
USB_DP_SUB_CON
USB_DM_SUB_CON
U605
USB_ID
MHL_DP
MHL_DM
MHL_SEL
TP610
C609
C638
TP_USB_DP
TP_USB_DM
USB_DP
USB_DM

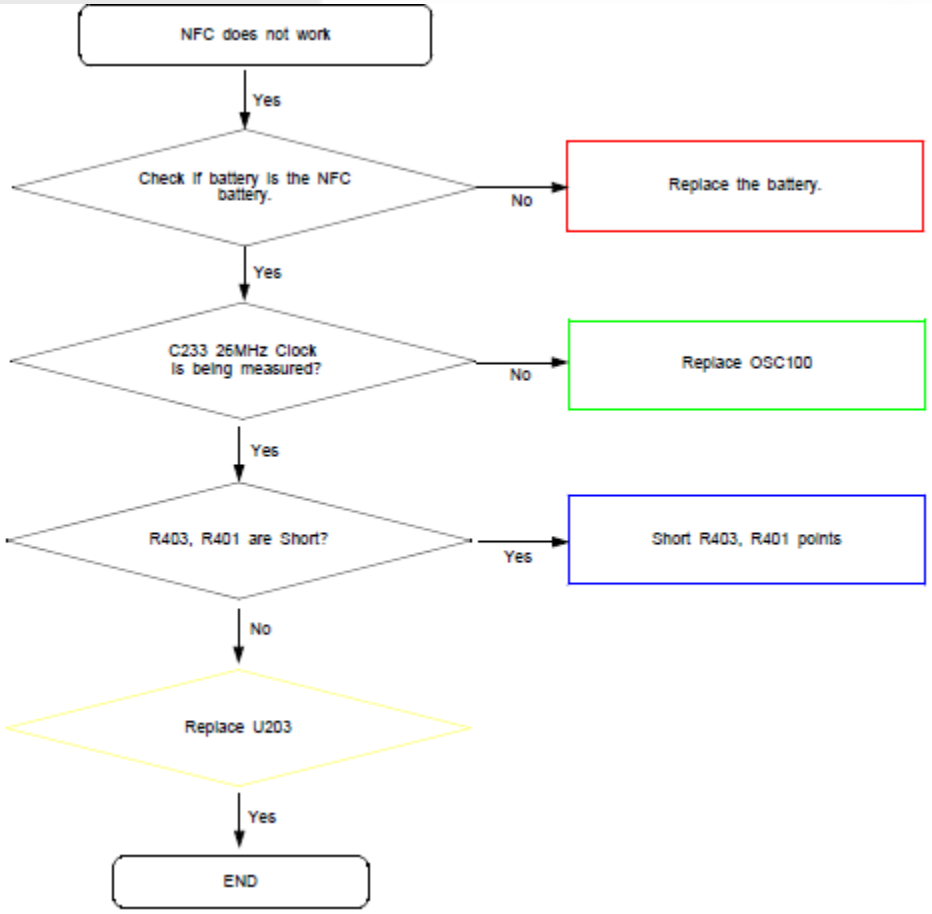
OTG

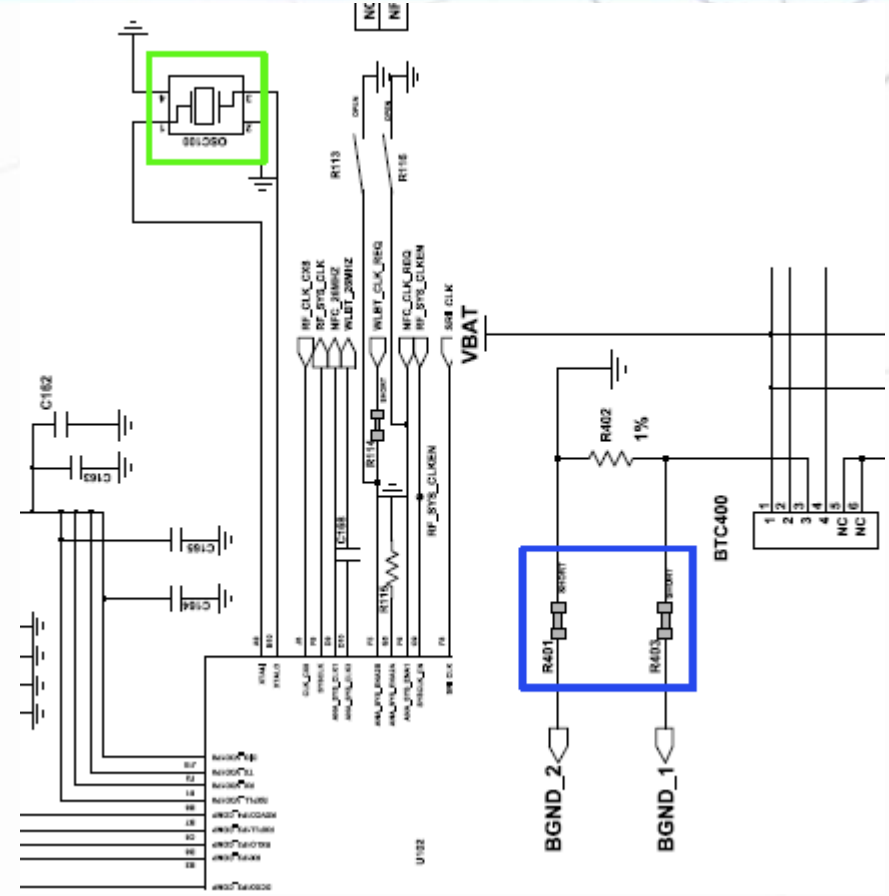


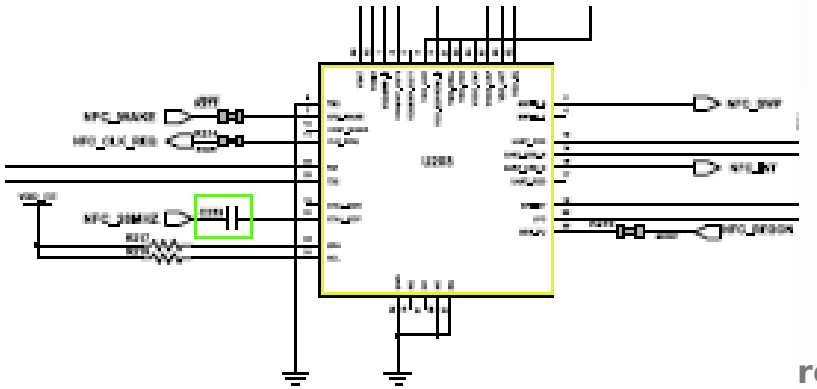


Telecommunication Network

NFC

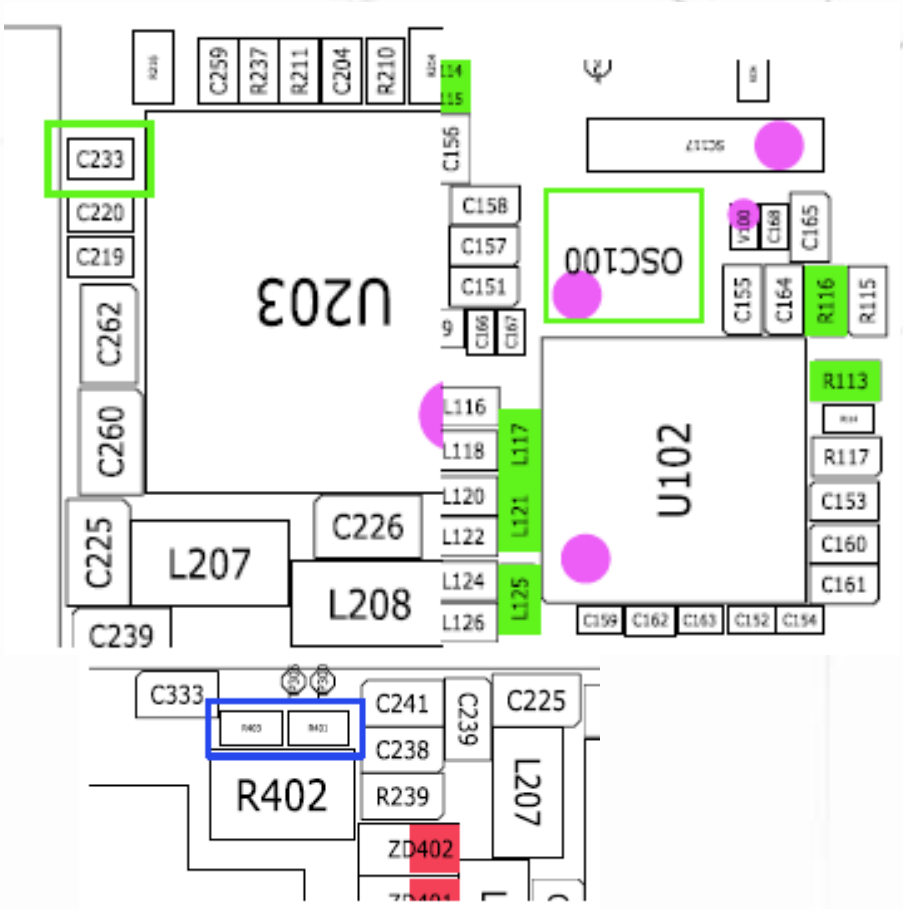






Telecommunication Network

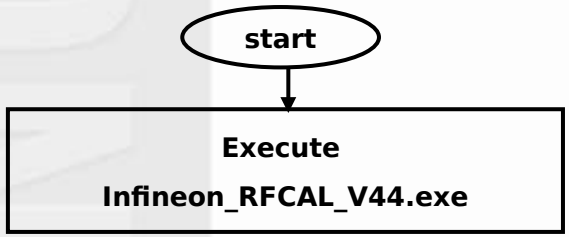
NFC

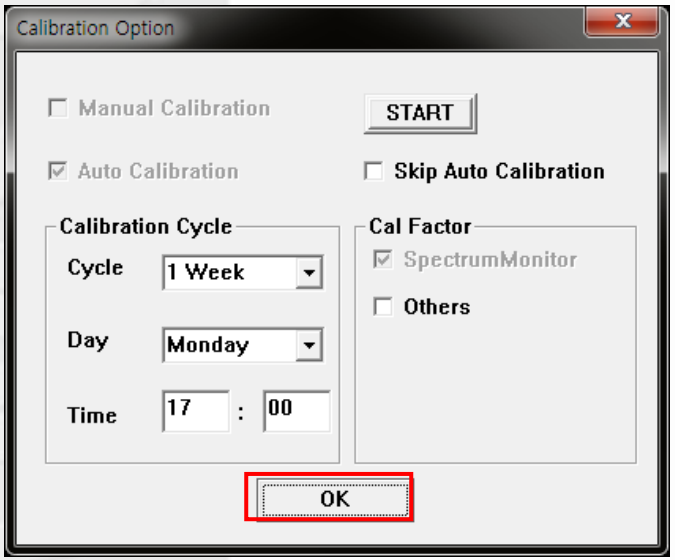

C259
R237
R211
C204
R210
C233
C220
C219
C262
C260
C225
L207
C239
C226
L208
U203
C156
C158
C157
C151
OSC100
C165
C155
C164
R116
R115
R113
R117
C153
C160
C161
U102
L116
L118
L120
L122
L124
L126
L117
L121
L125
C333
C241
C238
R402
R239
ZD402
C239
C225
L207

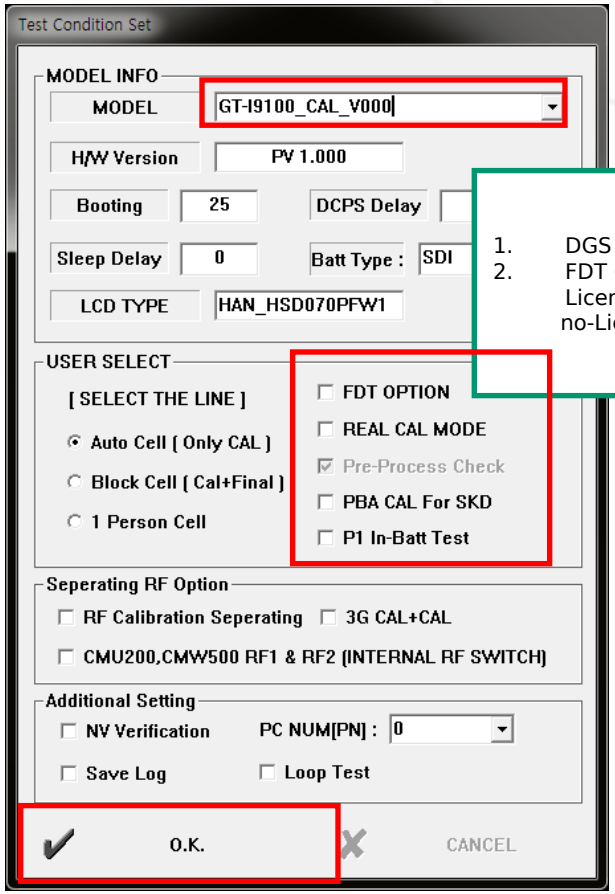
Contents

- Concept & Main features
- Block Diagram
- Component & Location
- Disassembly and Assembly
- Trouble shooting
- **Calibration**

Calibration

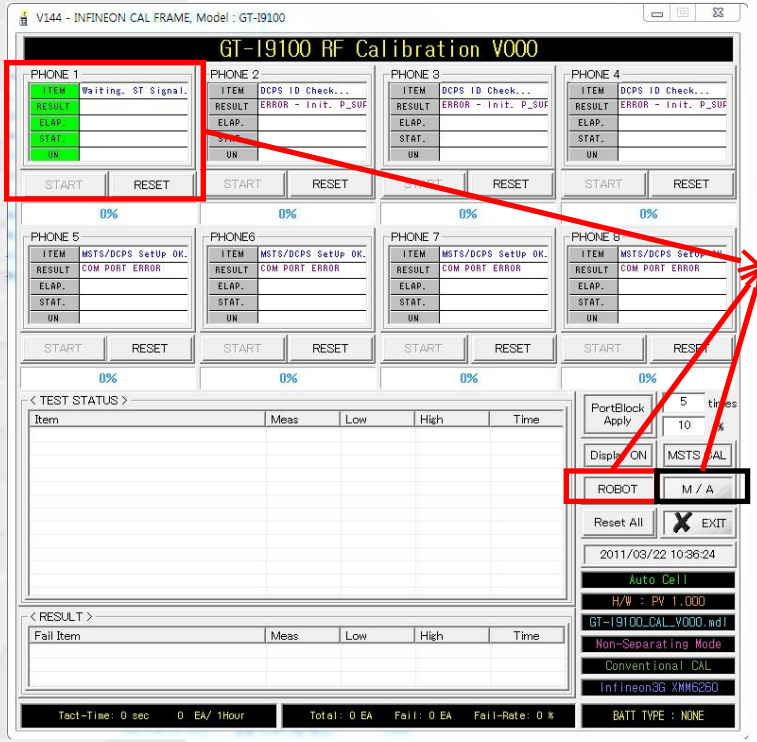




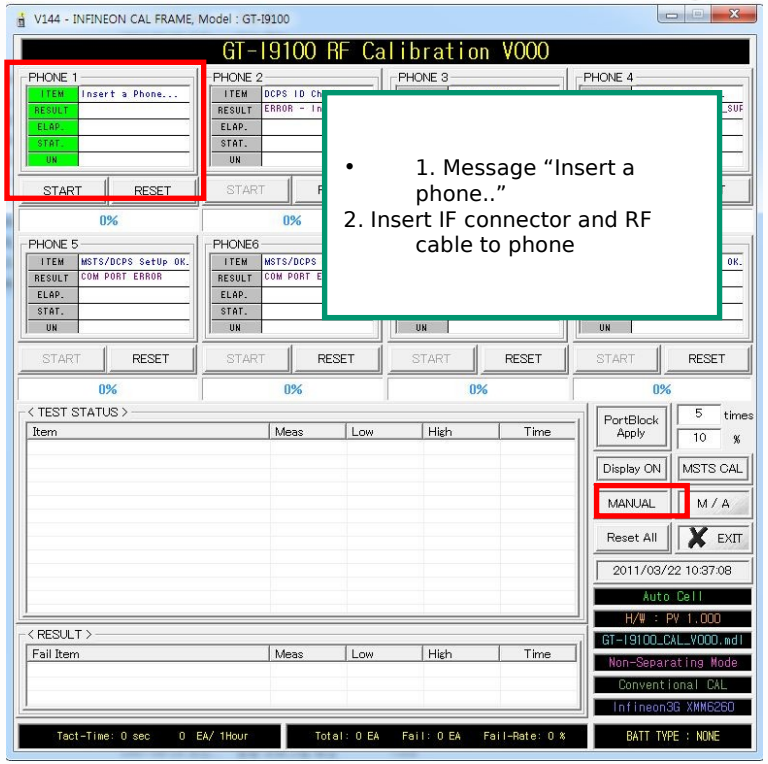


1. DGS Read : un-check
2. FDT Option : if you have License : check , no-License : un-check

Calibration



- 1. Message “Wating.ST Signal
2. Click the M/A button
3. Change Automatic mode to Manual mode



- 1. Message “Insert a phone..”
2. Insert IF connector and RF cable to phone

- THE END –